Canada's
Forest
Industry

the next twenty years: prospects & priorities

Pulp
and Paper

SIMONS Woodbridge, Reed
& Associates

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a division of HA Simons Ltd.

VOLUME III

PULP AND PAPER - DETAILED PRODUCT ANALYSIS

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PREFACE
TO VOLUME III

This study of the Canadian Forest Products Sector was commissioned by the Canadian Forestry Service. The purpose of the study is to assess the development potential for the sector. The study assesses the demand outlook for existing and potential forest products, the current and potential competitive position of the various sub-sectors of the industry in Canada and the available resources.

The full report on this study comprises six volumes. The contents of the full report are outlined as follows:

Volume I	Strategic Analysis
Volume II	World Demand - Supply
Volume III	Pulp and Paper
Volume IV	Wood Products
Volume V	Fibre Assumptions
Volume VI	Cost Projections

Volume III comprises the detailed analyses of the outlook for market pulp and major grades of paper and paperboard.

It is designed to provide a "stand alone" analysis for each product. The chapter on newsprint, for example, provides a comprehensive assessment of the potential for this sector of the industry without significant reference to other chapters in this volume. Some issues, like cost competitive position and fibre supply, are referred to only as needed to support this analysis. These subjects are dealt with in detail in other volumes.

The style employed is one which begins with an overview of the significant issues, findings and conclusions. As the chapters unfold, the analysis progresses into an increasing level of detail in support of these over-riding issues and conclusions.

The depth of analysis provided in this report is also designed in accordance with the relative significance of the product sector to the development of the industry. Consequently, products such as newsprint, market pulp and printing & writing papers are dealt with in more detail than some of the other product sectors. This does not diminish in any way the importance of other products to the total development and completeness of the industry. This study has been careful to recognize that every sector can play an important role, depending on the individual circumstances surrounding the existing or potential enterprises involved. It was not the intent of this study, however, to provide a comprehensive view that contemplated every individual circumstance. Rather, it is intended to provide sufficient detail to support the overall strategic directions that are considered most relevant to the industry in general.

The reader should also be aware of the time frames for this analysis. The study is primarily interested in the long-term view, defined here as the Year 2010. A short-term view is also provided, however, in order to relate the outlook to activity that is visible today. The short-term time horizon has been set at the year 1995.

The analysis quantifies the development potential for the industry sectors in terms of likely scenarios for both the short term and the long term. The scenarios are necessarily speculative in nature, and are provided for the more dominant product sectors only. The scenarios are considered plausible, however, and are believed to be realistic within a reasonably wide range of constraints such as fibre supply.

While this volume provides a stand alone analysis for each of the major product sectors, it should be recognized that there is considerable interdependence between the various product groups. The existing capital assets in one sector affect the development in other sectors. Also, the product sectors compete for the available fibre resource in situations where fibre availability becomes a constraint.

This volume takes the analysis only to the stage of a development scenario for each product sector. The integration of the various products into a national multi-product development scenario is presented in Volume I of this study.

I

PRINTING AND WRITING PAPERS

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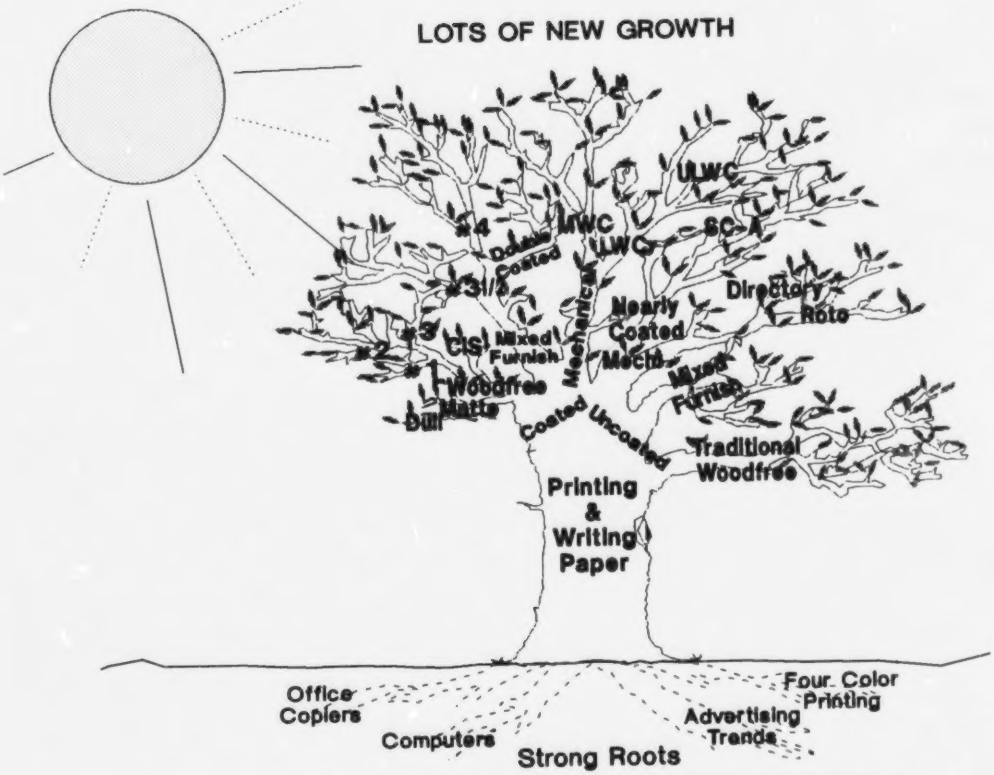

LOTS OF NEW GROWTH
ULWC
#4
MWC
Double Coated
LWC
SC-A
#3 1/2
Mechanical
Directory
Roto
Nearly Coated Mech.
#3
CIS
Mixed Furnish
#2
#1
Woodfree
Mixed Furnish
Matte
Dull
Coated
Uncoated
Traditional Woodfree
Printing & Writing Paper
Office Copiers
Computers
Strong Roots
Advertising Trends
Four Color Printing

"HELPING TO GROW A NEW BREED OF TREE"

Opportunity Overview

Printing and writing papers provide the Canadian paper and paperboard industry with its single greatest opportunity for new investment and growth. Growth in demand has, and will continue to, outstrip any other segment of the industry. Canada sits adjacent to the US, the largest single market in the world. The value-added nature of the products is attractive to industry, labour and government alike.

For Canada, the question is not whether printing and writing papers provide an opportunity, but rather which segments of this large and diverse product category are the most strategically beneficial. Canada will grow in all sub-segments, but which ones make the most sense in both the short and long-term?

The following analysis will show that most sub-segments provide the basis for some degree of opportunity, but that the mechanical fibre-based grades will become the strategic cornerstone for many Canadian producers over the long-term. This view is supported by market growth, by Canada's relative cost competitive position and by fibre quality and availability considerations. Canada also has a situation where there are a large number of existing mills which may be upgraded into these higher value products.

The marketplace is increasingly demanding higher performance characteristics at lower cost. Technology has come to the aid of paper producers faced with these conflicting demands. New mechanical pulping technologies and papermaking techniques are permitting the use of increasing quantities of lower cost mechanical fibre in place of higher cost chemical fibre. These high yield pulps will use Canada's remaining fibre resource much more efficiently. They will also permit the increased use of Canada's ample reserves of low density hardwoods.

The extent to which Canadian producers capitalize on these opportunities will depend on many complex and site specific factors. The availability of financially viable candidates for conversion and/or integration, as well as local fibre considerations and proximity to major market centres, will give the short and long-term scenarios a regional flavour.

It is not unreasonable to expect, however, that the Canadian industry will more than double its output of these high value products and establish itself as a significant force in the North American marketplace, as well as, becoming a meaningful supply region in a global context.

Size and Nature of the Market

Printing and writing (P&W) papers cover a wide variety of detailed product segments that serve an even wider variety of end-use applications. The segments have historically been broadly defined in terms of pulping technology (mechanical vs. chemical) on one scale and construction (coated vs. uncoated) on the other (Figure 1-1).

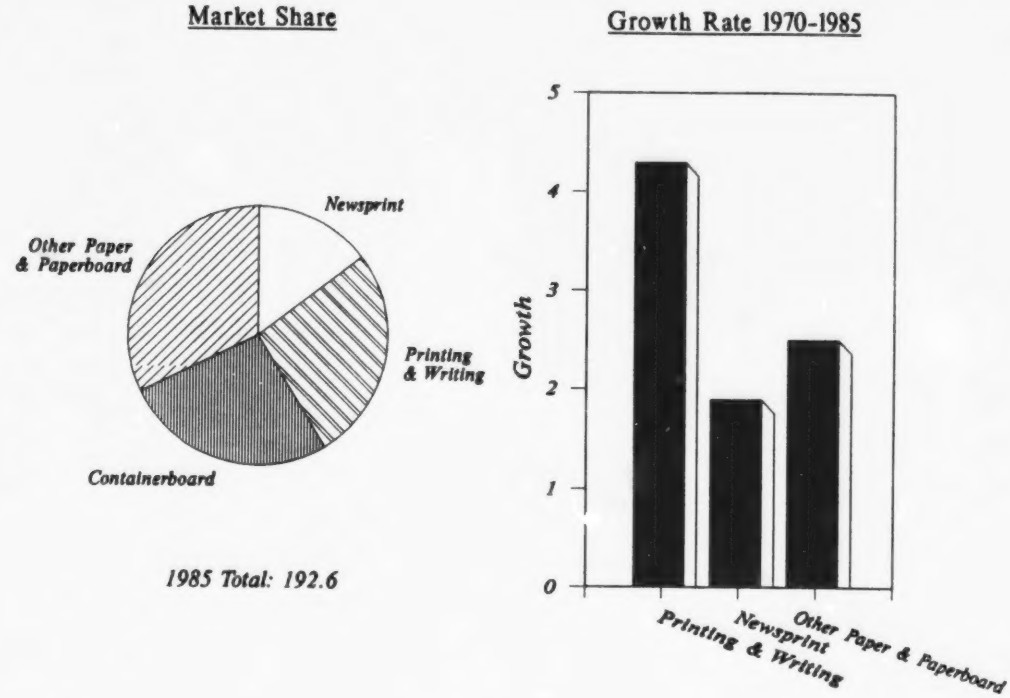
Figure 1-1
Printing and Writing Papers
Historical Designation of Segments

	Mechanical Pulping	Chemical Pulping
Coated	*Coated Mechanical*	*Coated Woodfree*
Uncoated	*Uncoated Mechanical*	*Uncoated Woodfree*

Source: WRA

Collectively, these segments have grown more rapidly over the past two decades than any other segment of the industry to form a global market that now exceeds 50 million tonnes, almost double the size of the world newsprint market (Figure 1-2).

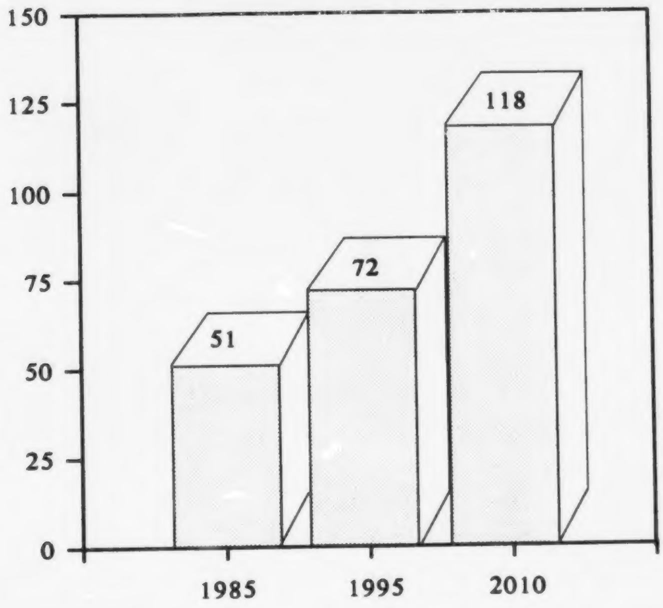
Figure 1-2
Global Market Size and Growth Rate
Major Product Categories



Source: FAO, WRA

While these historical growth rates are not expected to persist indefinitely, the more modest future growth forecasts still result in a doubling of the consumption by 2010 to approximately 120 million tonnes (Figure 1-3)

Figure 1-3
World Printing & Writing Paper Demand
Projected to the Year 2010
(millions of tonnes)



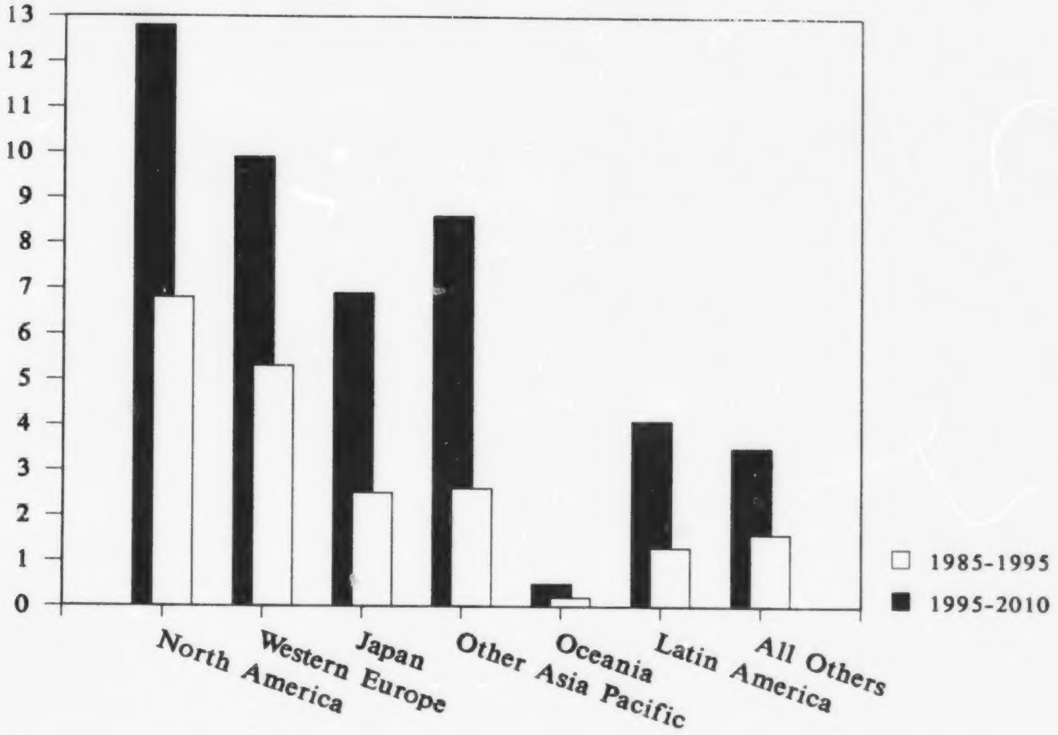
Source: FAO, RISI, WRA

The magnitude of this expected 67-million-tonne increase in demand between 1985-2010 is made more dramatic by considering the number of paper machines necessary to meet this growth. Given an average machine output of 200,000 tonnes per year, this increase represents 339 additional machines. Even though some of this demand will be met by paper machine rebuilds and upgrades, it seems reasonable to assume that at least 250 new machines will be necessary by the year 2010, with as many as 75 of these required by 1995.

In developing economies, average annual growth in consumption has tended to be 2-3 percentage points higher than that of the industrialized nations. This is due to a number of reasons: increasing economic growth resulting in an expansion of end-uses (advertising, commercial printing, etc.), increasing literacy rates because of improved educational programs, higher consumer income and growing population.

Because of a lower absolute market size, however, and despite a continuation of somewhat more rapid growth in developing nations, the bulk of the absolute growth will still originate from the developed countries of the world (Figure 1-4).

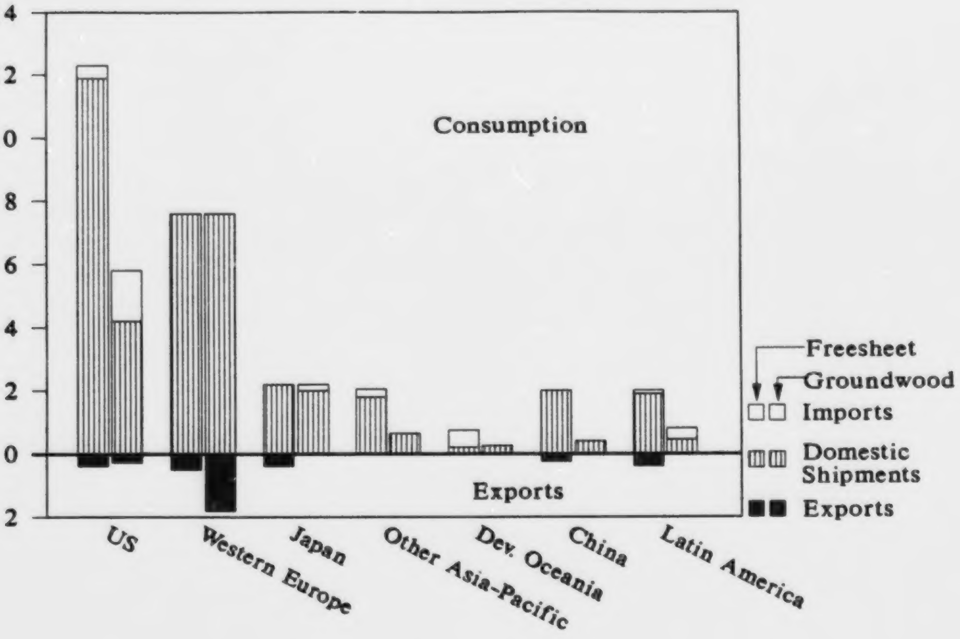
Figure 1-4
Printing & Writing Paper Incremental Demand
By Market 1985-2010
(millions of tonnes)



Source: FAO, ADB, WRA

P&W papers are not highly traded internationally compared to newsprint, for example. There has been some quantity of trade from Western Europe to the US in recent years, however, mainly in mechanical fibre-based products (Figure 1-5).

Figure 1-5
International Production, Consumption and Trade
Printing & Writing Papers



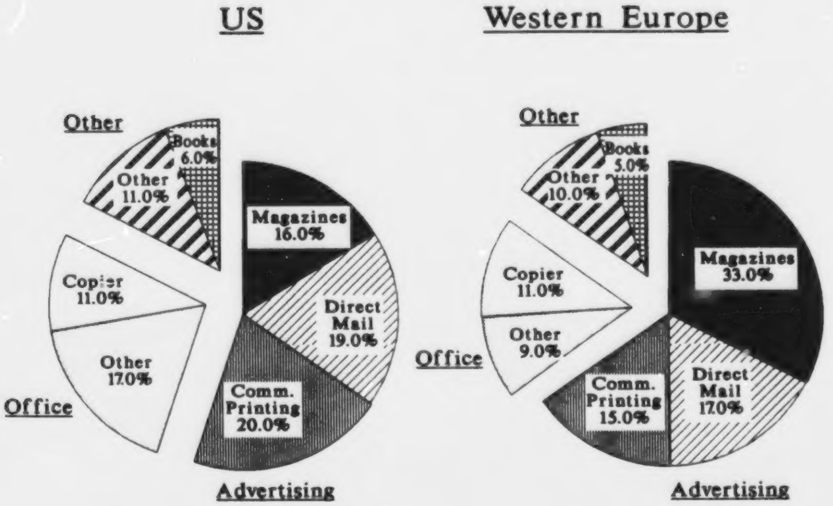
Source: FAO, EPI, RISI, ADB, WRA

Fundamental Demand Factors

While overall consumption correlates reasonably well with overall economic activity, growth rates have outperformed general economic indicators. The driving force behind the growth in P&W papers does not lie in macro-economic factors but rather in more fundamental end-use market related factors.

In particular, trends in advertising and the office sectors of the economy play a dominant role, accounting for 80-90% of total paper use (Figure 1-6).

Figure 1-6
Printing and Writing Papers
End Use Analysis



Source: ECC, CIS

Technological advances have provided the key ingredients that are driving demand in both the advertising and office end-use sectors. Similarly, technological progress has allowed the international pulp and paper industry to respond to the new demands placed on it by these same trends. One of the keys for Canadian producers' ability to respond to the opportunity presented by this segment of the industry will be a determination to be on the leading edge of the technologies required to give these changing end-users what they need to remain competitive.

Advertising Trends

Modern marketing techniques have introduced the concepts of segmentation and differentiation to the producers of products and services worldwide. The advent of computerized data analysis has revealed consumer preferences which is the first step in determining how to cater to these individualized tastes.

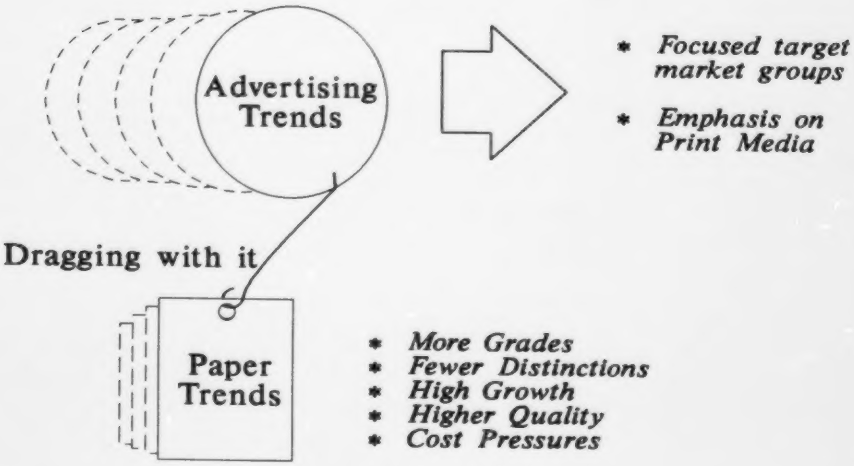
Similarly, the advertising of these products and services has had to respond to these specialized target marketing trends. The ability to target a specific message to a select audience has also been aided by the proliferation of computerized data bases and the availability of more marketers to access these data.

This has resulted in a niche type approach to advertising (i.e., looking for different methods of delivering the advertising message). One of the significant shifts has been the increased use of print media, especially for the "short run" promotion materials that accompany fragmented target market groups, in place of television advertising which is inherently more broad based. Another factor is the saturation phenomenon in television advertising. For various reasons there is a declining ability to increase absolute advertising space in this media.

Shifts between media will continue, however, as each media strives to maximize its share of total advertising expenditures. On balance, the trend towards specialized target markets supports the continued strong growth of print media-based advertising.

The same fundamental dynamics are also affecting the types of paper used in print-based advertising. The increased specialization permits a higher quality and cost approach to the smaller audience. High quality specialized catalogues are replacing mass circulation catalogues. The effect on paper is a general increase in the absolute level of quality required and an ever increasing fragmentation in the quality spectrum of paper products (Figure 1-7).

Figure 1-7
Advertising Influence on Paper Trends


Advertising Trends
* Focused target market groups
* Emphasis on Print Media
Dragging with it
Paper Trends
* More Grades
* Fewer Distinctions
* High Growth
* Higher Quality
* Cost Pressures

Source: WRA

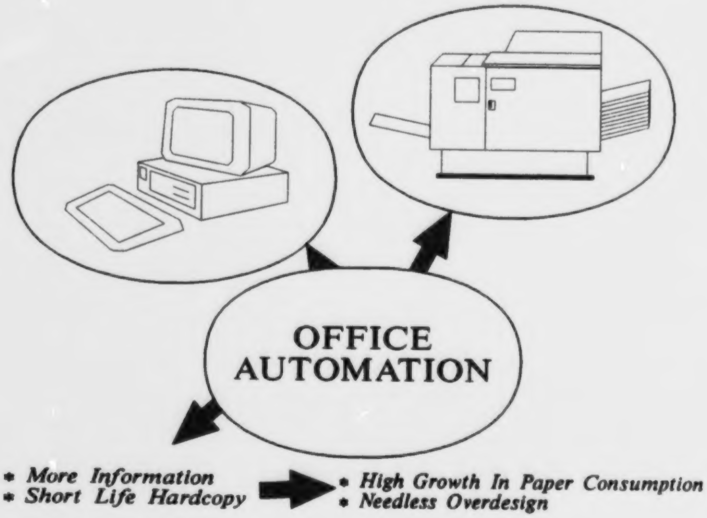
This fragmentation process can be viewed as both a problem and an opportunity. Producers who favour stability in product design and large volume segments will be less comfortable in this changing environment. Others may view the change process as an opportunity to differentiate their paper product lines to gain competitive advantage. We will see that technological evolution in the design and production of paper products has engendered a new generation of products that cater to this changing environment in the advertising industry.

Office Automation

The technological revolution in the office is providing a similar environment of growth and change in office paper use. The widespread introduction of the computer as a data manipulation tool, rather than simply an elaborate scientific calculator, has helped spawn the "information age". The flow of information as a result of this capability has grown very rapidly, creating in some cases, entirely new industries dealing with the use of information.

The demand for computer printout paper has therefore provided one of the pillars of office paper growth. Another has been the advent of the office copier. Copiers that are fast and inexpensive have created an ever increasing demand for copy paper. The cost of paper has been modest in relation to other office costs and therefore high quality paper has been the historical preference of the office world. There is a growing realization that the life span of most office paper has declined sharply, however, and that traditional copy paper has been vastly overdesigned. This again, is creating an environment of change for traditional office paper products (Figure 1-8).

Figure 1-8
Office Automation - Effect on Paper



Source: WRA

The decade-old vision of a paperless office has clearly not materialized. Instead, the fundamental shifts that created the vision have themselves led to increases in demand for office products. For example, computerization, rather than reducing paper in the office, has created new demand for "disposable hard copy" in an age that is dealing with increasing quantities of information.

Trends in Product Design and Development

The single most dramatic shift in paper design has to do with the fragmentation of grades referred to in Figure 1-1. The historical distinctions that segmented products as coated or uncoated and by pulp type, are becoming increasingly blurred. Varying degrees of fillers, together with varying amounts of surface treatment and/or coatings, are creating a continuous spectrum of grades ranging from the traditional uncoated designation to new double coated products (Figure 1-9).

A similar situation is evolving with regard to pulp types. The historical definition of a "woodfree" product meant that the fibre content was at least 90% chemical pulp. Historical purists in the industry put their own definition at virtually 100%. Mixed pulp products, in the past, were more or less confined to the coated mechanical category which used about equal quantities of the two pulp types. Today a new generation of pulps are emerging which themselves blur the historical pulping distinctions. CTMP, for example, is somewhat of a cross between the two types employing a combination of both chemical treatment and mechanical separation in the pulping process. Increasing proportions of mechanical pulp are also making their way into products that are competing for historical woodfree applications.

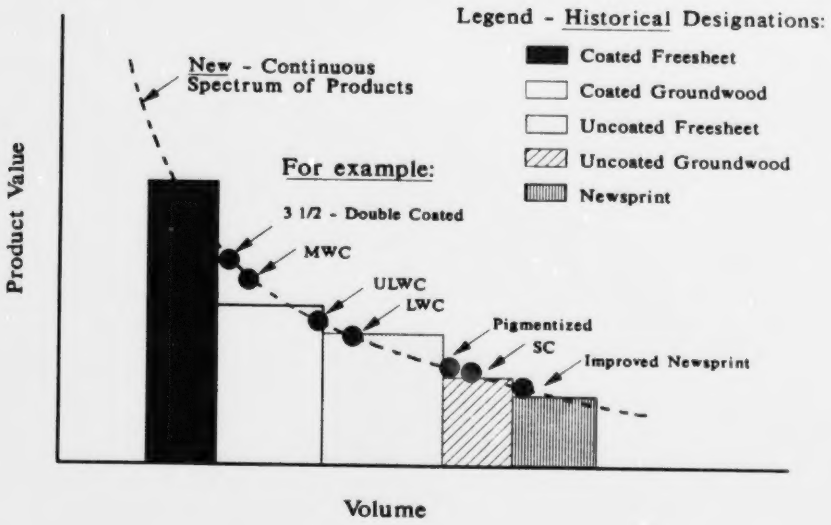
The term woodfree refers to a paper that is "free" of mechanical fibre. The term "wood containing" is also occasionally used to designate a mechanical fibre-based paper. Mechanical fibre has a historical connotation that is associated with raw wood, or fibre in an unaltered form. The historical perception of wood is also one that relates to newsprint, using a low grade of mechanical pulp with limited cleaning and refining of rejects. The presence of dirt particles and shives (bundles of unseparated fibres) not uncommon in this context, has contributed to the perception that mechanical fibre is inherently of low quality.

> *The advancement of mechanical pulping technologies around the world is slowly changing this perception. This has gone hand in hand with improved cleaning and bleaching systems that now enable the production of clean, high brightness pulps that are virtually indistinguishable to the eye of the uninitiated.*
>
> *Ardent "woodfree" fundamentalists will resort to chemical testing means (e.g. the phloroglucenal test) to detect their unwanted "wood" should the paper producer try to fool them with these look-alike replacements. However, more users are realizing that mechanical fibre-based papers are not only a cost effective replacement for many historical woodfree applications but also possess quality and performance characteristics superior to the traditional products.*
>
> *It is interesting to note that while most countries define woodfree papers as containing a maximum of 10% mechanical pulp, Canada's definition allows up to a maximum of 50%. This definition has historical roots more related to commercial gain than philosophical underpinnings. It is interesting, nevertheless, that Canada has chosen a more liberal definition in this area where further change is likely to be the norm.*
>
> *Note: Explanatory material is included throughout this report to assist readers who are unfamiliar with industry practices or terminology.*

The result of these product evolution dynamics is likely to be continuing fragmentation in product design and definition, as well as an ongoing environment of product evolution and change.

The process of change, to date, has been most pronounced in the mechanical fibre-based spectrum of printing paper products. In recent years a new range of products has emerged in the international industry, creating an almost continuous spectrum of products on both a quality and price scale (Figure 1-9).

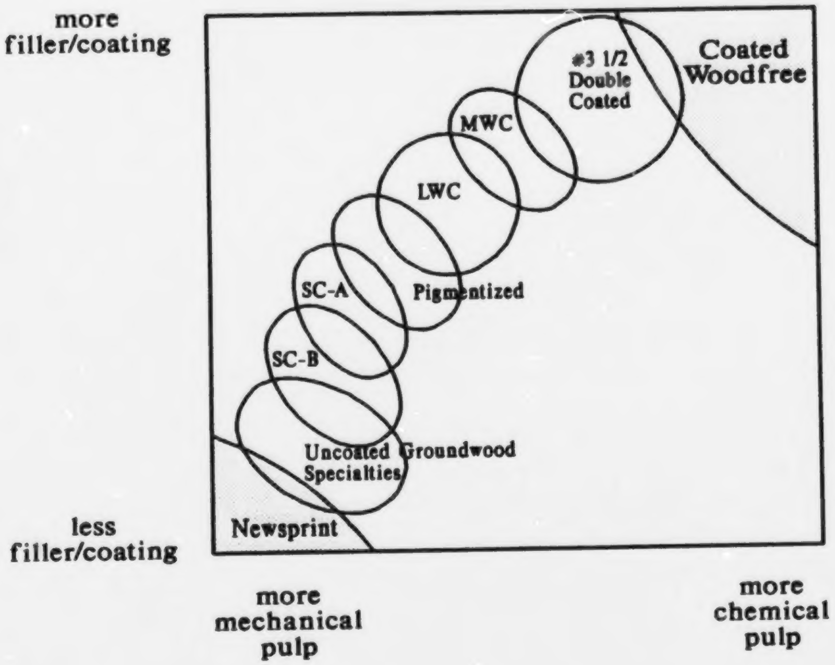
Figure 1-9
Printing Papers - Spectrum of Products
Current vs. Historical



Source: WRA

The range of printing paper products that fall in between the historical classifications of uncoated mechanical (also referred to as uncoated groundwood specialties) on the one hand, and coated woodfree on the other, is already filled with a host of new segments and sub-segments (Figure 1-10).

Figure 1-10
Mechanical Fibre-based Printing Papers
Current Spectrum of Products


more filler/coating
less filler/coating
more mechanical pulp
more chemical pulp
#3 1/2 Double Coated
Coated Woodfree
MWC
LWC
SC-A
Pigmentized
SC-B
Uncoated Groundwood Specialties
Newsprint

Source: WRA

The much talked about supercalendered (SC) papers cover a range of products with varying quantities of clay filler designed to improve smoothness and opacity (and reduce cost). Lightly filled sheets have become known as SC-B while heavily filled sheets have taken on the SC-A designation. Clay filled sheets are still considered to be of lower quality than clay coated sheets.

A "coated" paper has the clay material concentrated on the surface and uses a different application technique than "filled" papers where the filler material is more or less homogeneously distributed throughout the thickness of the paper. Developments in coating techniques are narrowing an already small gap between the two, with "lightly coated" or "pigmentized" and "nearly coated" terminology beginning to emerge.

Pigmentized is a term applied to a recent development that is filling the "hole" between SC-A and LWC. Refinements in coating application methods and paper manufacturing will continue to evolve rapidly in this area, designed to give the printing consumer a better printing paper at lower cost.

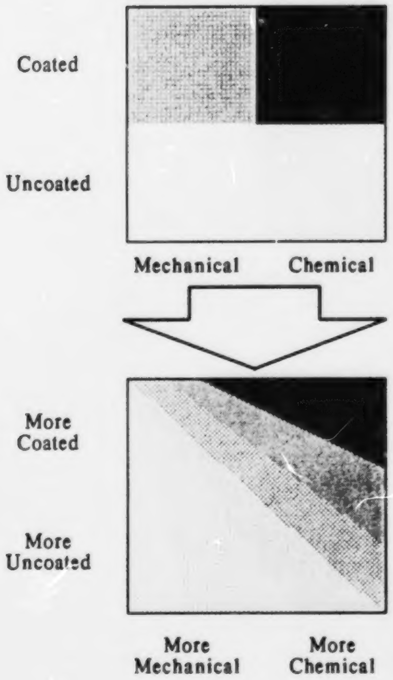
Western European paper manufacturers, especially the Finns and West Germans, have been extremely successful in developing these new mechanical fibre-based printing and writing papers. As a result of both new process technology and product development, high quality wood-containing printing papers are not only competing with certain woodfree grades but are creating new market niches.

Some of this European success has been transferred to the US, but there is considerable room for development in North America. The Xerox Corporation, one of the world's largest users of reprographic (photocopy) papers, believes that the development of a wood-containing reprographic grade is perhaps only five to seven years away.

The rate of emergence of these and other new grades will differ over time. During the 1985-90 period, LWC consumption will continue to grow. Pigmentized grades will be slow to start but demand should accelerate later. Today's uncoated groundwood specialties will lose market share to the newer and higher quality SC-A and SC-B grades.

The traditional categories will grow rapidly over the 1985-90 period and then give way to the fragmentization process in the early 1990s as capacity to produce these other grades is installed. Printing and writing paper grade classifications, as they exist today, are changing very quickly with new grades being introduced very rapidly. In the future, grade classifications will be more related to end-use requirements than the historical product boundaries (Figure 1-11). These new definitions will cut across pulping technologies and the architecture of the sheet, paving the way for considerable freedom in the use of mechanical and quasi-mechanical pulps to optimize the performance and value of the product to the end-user.

Figure 1-11
Printing and Writing Papers
Product Trends



Current

- *Rigid product categories*
- *Consumer resistance attitude*

Future

- *Fragmented Segments*
- *Fading of fibre and coating related distinctions*
- *Performance defined purchasing patterns*

Source: WRA

While movement in this direction is already evident in Europe with coated woodfree grades, there has been less movement worldwide for the traditional uncoated woodfree applications like office papers. Certainly, the economic pressures to get more for less have been more acute in the commercial printing applications where coated woodfree papers are used. Copy paper, on the other hand, is an uncoated woodfree grade that is close to a commodity, and as such, will increasingly bend under economic forces.

One of the remaining technological hurdles, which will limit the widespread use of mechanical pulps as we know them today, will be the issue of colour reversion.

Colour reversion of paper refers to the yellowing characteristics of the product, most common in newsprint, and occurs when a newspaper is left in the sun for a short time. This yellowing is caused by the interaction of the sun's ultraviolet light and lignin which is retained in mechanical pulps.

While any bleached pulp today exhibits some degree of colour reversion, it is more prominent with mechanical pulps. The lignin, which is removed in the chemical pulping process but largely retained in mechanical pulps, is more sensitive to the action involved.

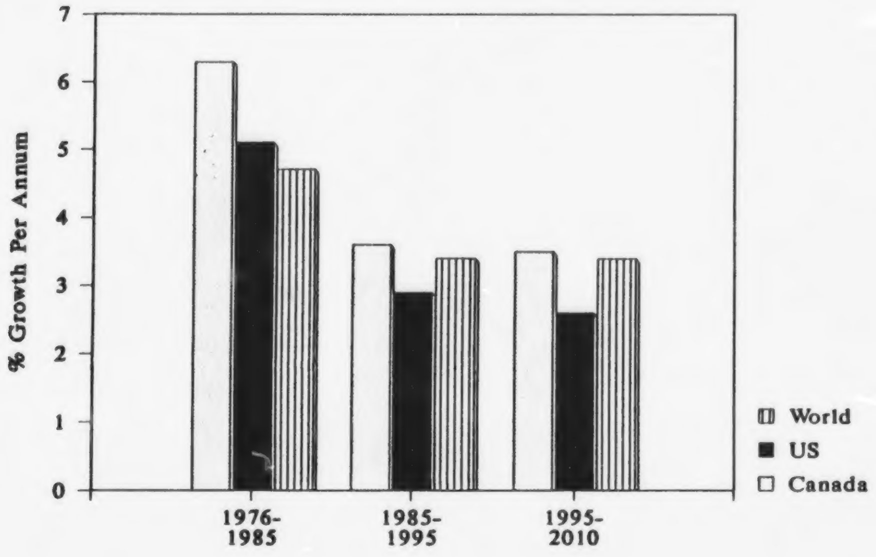
This is one of a number of areas where research and development in the Canadian community could establish Canada as a technological leader in a very important and strategically significant segment of the industry. Certain species of bleached CTMP, for example, display a degree of colour inertness that approaches that of bleached chemical pulps.

Analysis of Markets

Canada

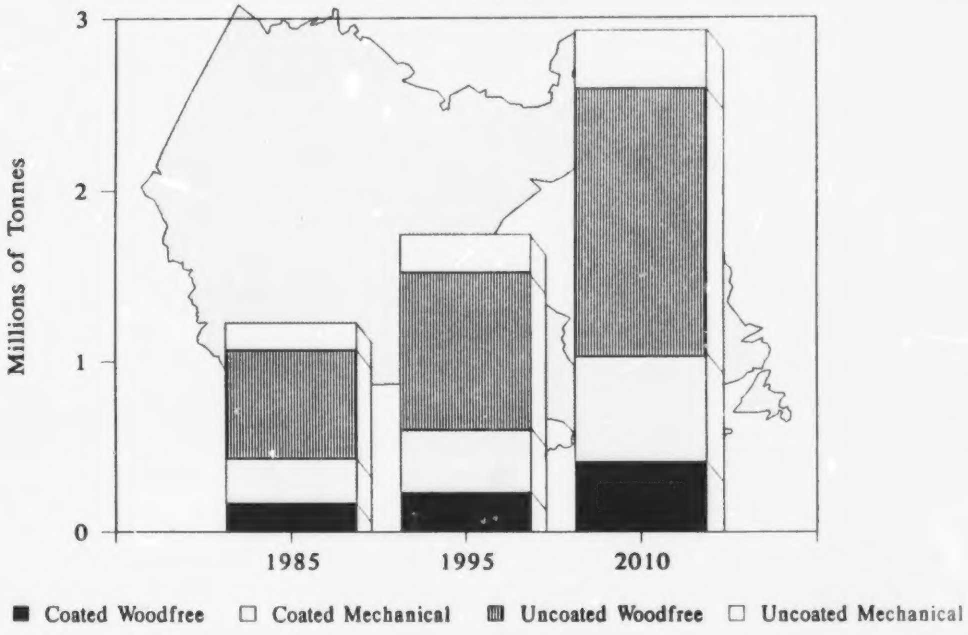
Canada itself provides demand opportunity in printing and writing papers. Growth in demand has been, and is projected to remain, faster than either the US or the world average (Figure 1-12). The uncoated woodfree sub-sector is the largest of the four and the only one which will exhibit sufficient absolute growth to justify significant capacity expansion based on domestic market considerations (Figures 1-13 and 1-14). The coated woodfree market also provides an opportunity, probably involving a conversion of modest scale. This is based on the high dependence on imports that now exist for these products.

Figure 1-12
Printing and Writing Growth Rates
Canada vs. US and the World



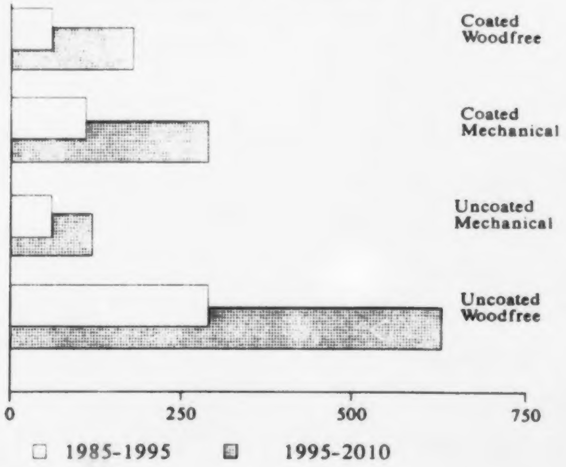
Source: RISI, WRA Estimates

Figure 1-13
Printing and Writing Consumption in Canada
Current and Forecast
(millions of tonnes)



Source: CPPA, RISI, WRA

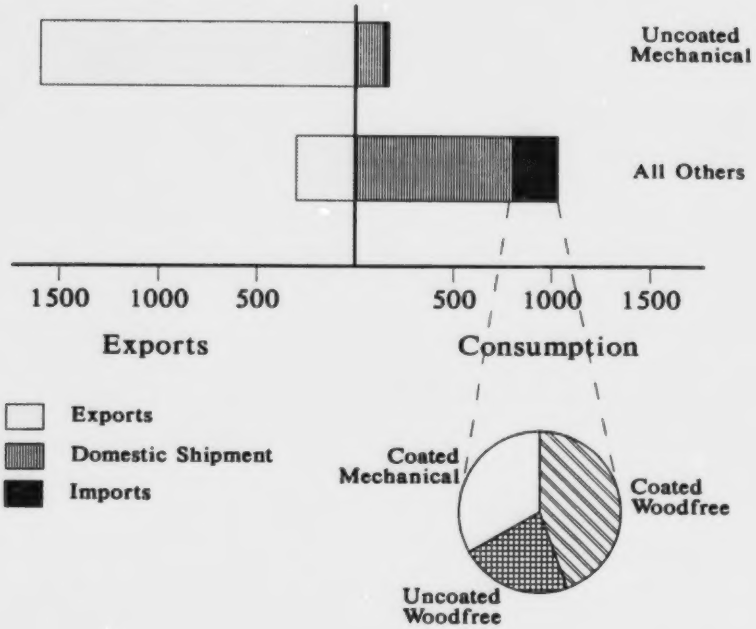
Figure 1-14
Absolute Growth in Demand in Canada
Printing and Writing Papers
(thousands of tonnes)



Source: WRA Estimates

The Canadian market is well served by the Canadian industry in the sub-sectors that are export oriented. Historically, this has been primarily the uncoated mechanical sector, which has developed as an extension of the industry's expertise in newsprint. The uncoated woodfree segment has also enjoyed a strong historical base, but has only recently modernized to take advantage of export markets. The coated mechanical segment has been weaker in the past than either of the above categories, but has also gained ground recently and is now in a better position to serve the Canadian market. The coated woodfree segment, however, is still poorly served with only one significant Canadian supplier and is still a heavy importer of these products (Figure 1-15).

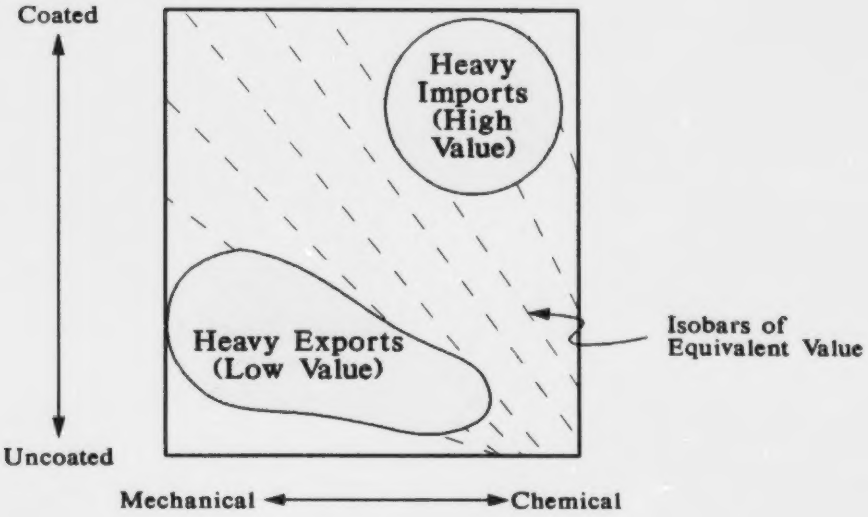
Figure 1-15
Production, Consumption and Trade
Canadian Printing and Writing Papers
(thousands of tonnes)



Source: CPPA, RISI, Statistics Canada, WRA Estimates

The roots of the Canadian industry lie in the historically "local" nature of the printing and writing sector, and the relatively small and geographically dispersed domestic market. Coated paper and uncoated woodfree producers have traditionally focussed on production for domestic markets, and have developed with the protection of heavy trade duties. A decade ago, imports were largely a result of particular grades or qualities that were not produced domestically. Trade duties have declined significantly in the past 10 years permitting greater imports, especially of the higher valued grades. The Canadian industry has not responded to the lowering of duties with equal zeal in all segments. They have begun with the expansion of the lowest value grades and are working their way up (Figure 1-16).

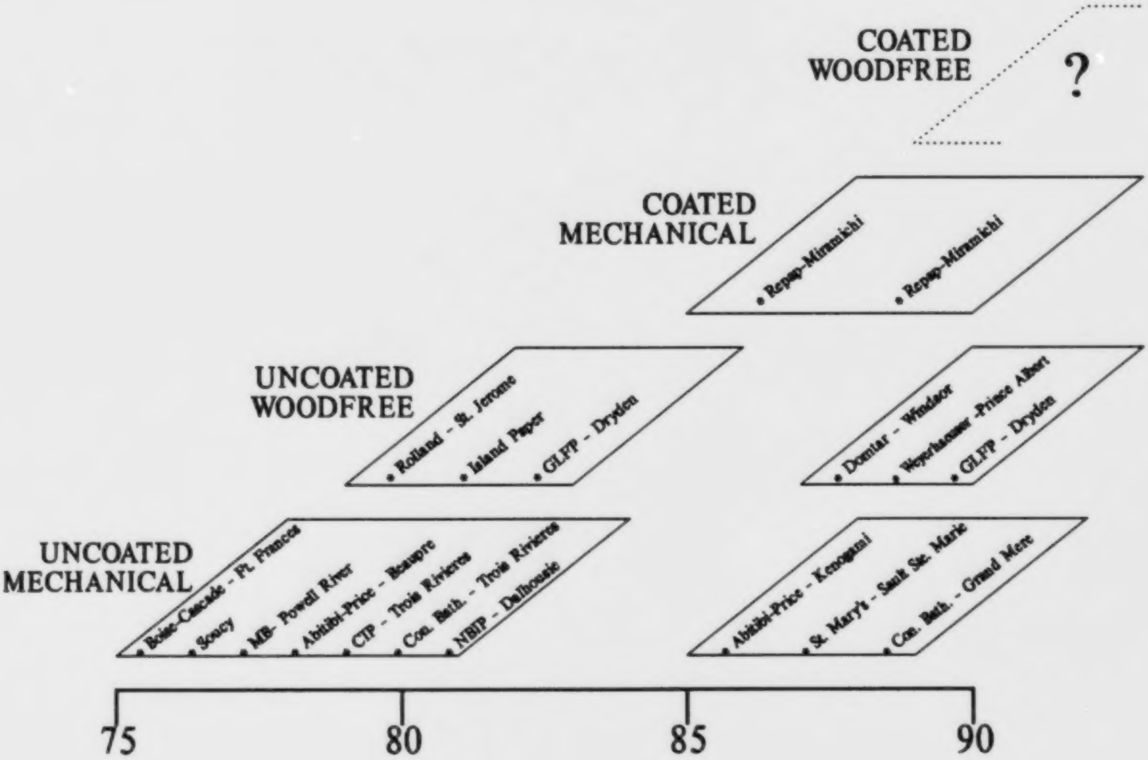
Figure 1-16
Canadian Import and Export Orientation
Printing and Writing Papers


Coated
Uncoated
Heavy Imports (High Value)
Heavy Exports (Low Value)
Isobars of Equivalent Value
Mechanical
Chemical

Source: WRA

Following the expansion of uncoated mechanical grades in the late 1970s and early 1980s, expansions in uncoated woodfree followed in the mid-1980s and are continuing. The coated mechanical segment has begun and promises to emerge gradually (Figure 1-17).

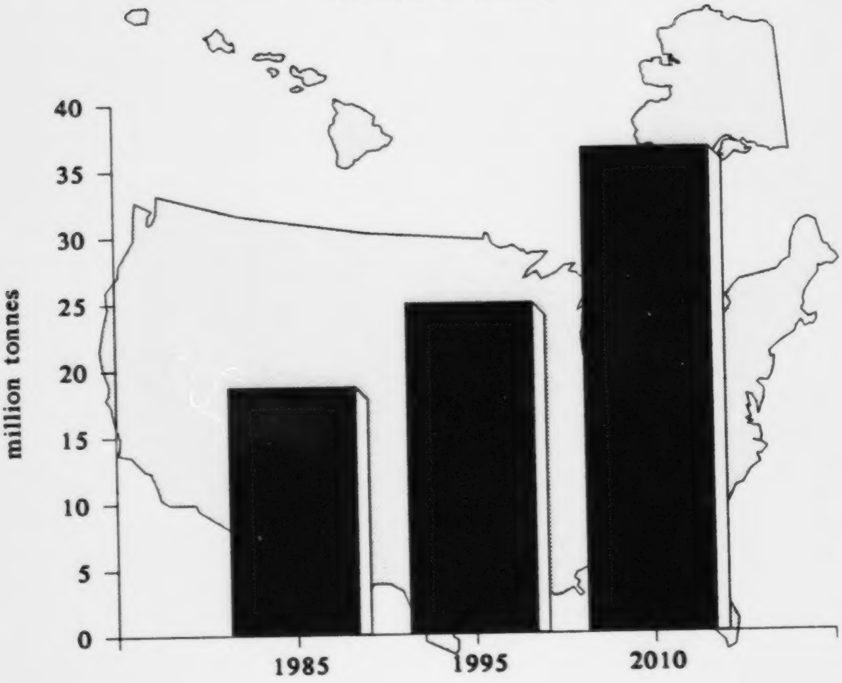
Figure 1-17
Capacity Expansion Eras in Canada
Selected Major Installations - Printing and Writing Papers


COATED WOODFREE
?
COATED MECHANICAL
Repap-Miramichi
Repap-Miramichi
UNCOATED WOODFREE
Rolland - St. Jerome
Island Paper
GLFP - Dryden
Domtar - Windsor
Weyerhaeuser -Prince Albert
GLFP - Dryden
UNCOATED MECHANICAL
Boise-Cascade - Ft. Frances
Soucy
MB- Powell River
Abitibi-Price - Beaupre
CIP - Trois Rivieres
Con. Bath. - Trois Rivieres
NBIP - Dalhousie
Abitibi-Price - Kenogami
St. Mary's - Sault Ste. Marie
Con. Bath. - Grand Mere
75
80
85
90

Source: WRA Data Base

The coated woodfree segment has not yet responded and, as a result, has been subject to dramatic increases in imports. Consequently, while the total market for coated woodfree is not that large (under 200,000 tonnes), it is estimated that as much as 50% of this is being supplied by imports. As one of the segments not already well supplied by Canadian producers, it represents at least a modest opportunity.

Figure 1-18
Forecasted Printing and Writing Demand in US
(millions of tonnes)

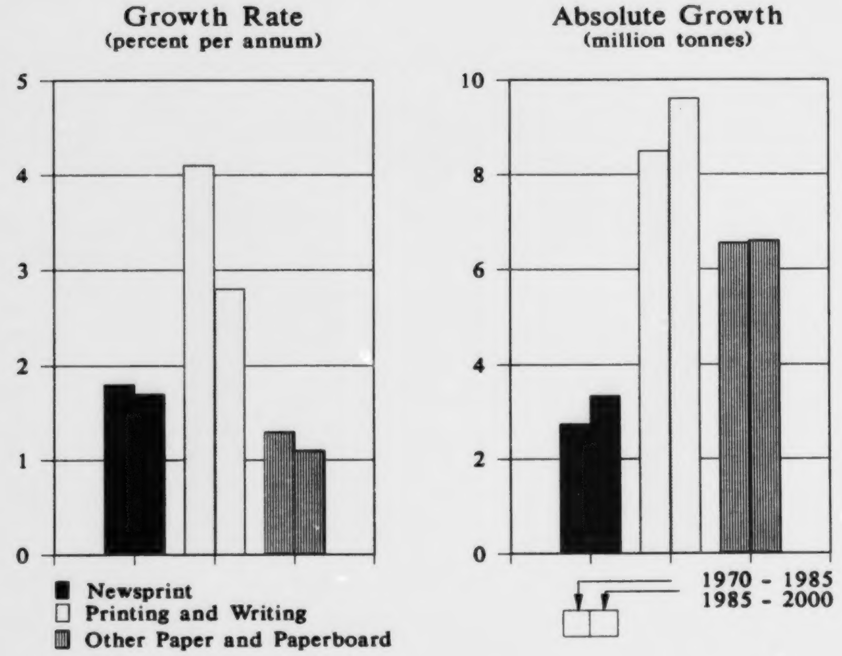


Source: FAO, RISI, CIS, WRA Estimates

United States

The US market is by far the largest single market for printing and writing papers in the world and despite a moderation in the historical rate of growth in demand, will continue to provide the largest absolute increase in demand (Figure 1-4). The absolute growth in printing and writing papers will dwarf that of newsprint and outstrip even the large "other paper and paperboard" category (Figure 1-19). Despite a lower growth rate, the absolute increase over the next 15 year period (1985-2000) will be higher than the previous 15 years.

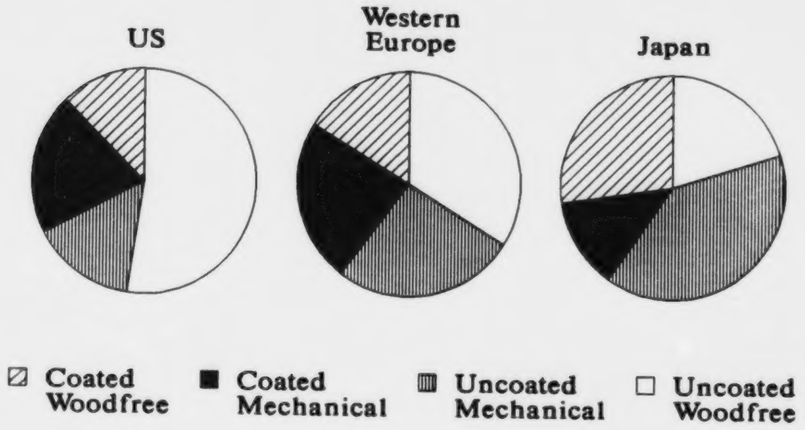
Figure 1-19
Historical and Forecasted Growth
US Paper and Paperboard



Source: CIS, RISI, WRA Estimates

The global trends in advertising and office automation described earlier in this chapter are also the driving force behind growth in overall demand and product changes in the US market. Some differences are evident, however, that have caused a different structure within the sub-segments of the printing and writing category compared to Europe and Japan, and are likely to continue to affect the profile of demand in the future. The consumption of printing and writing papers in the US is biased towards uncoated woodfree papers (Figure 1-20) which accounts for more than 50% of total demand.

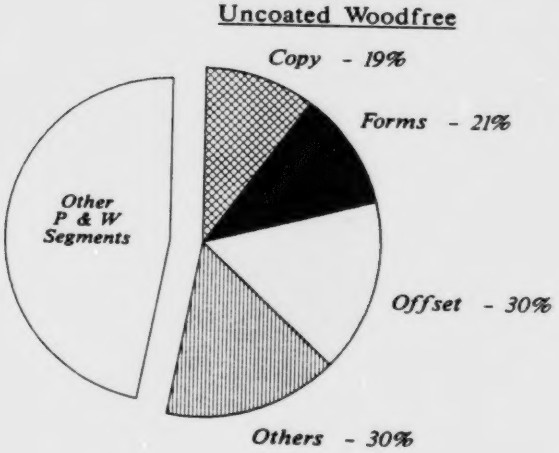
Figure 1-20
Sub-segment Breakdown of Printing and Writing Paper
US Compared to W. Europe and Japan
(percentage breakdown)



Source: RISI, EPI, JPA, WRA

The dominance of uncoated woodfree in the US is judged to be a combination of demand and supply led factors. Demand for copy and forms paper has been especially high and now accounts for about 40% of uncoated woodfree consumption (Figure 1-21).

Figure 1-21
Uncoated Woodfree - End Use Analysis - US Market
(1985)



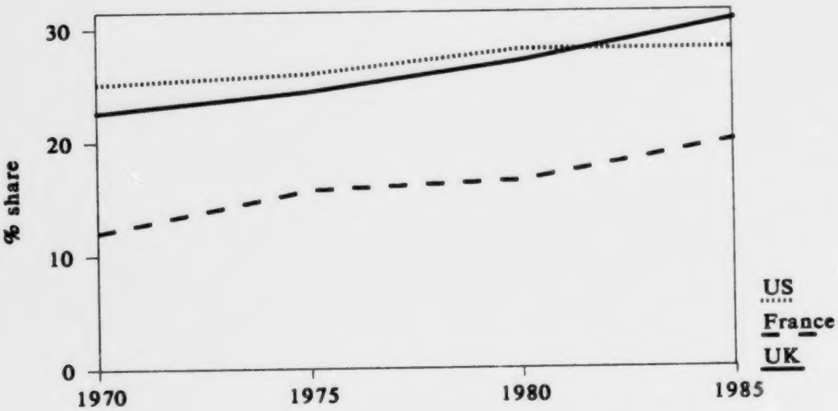
Source: RISI

The proliferation of office copiers and computers, of course, is leading demand as in other parts of the world. US society is less waste conscious than many other parts of the world and this has undoubtedly led to very high growth in "short life" printed material. This throw-away mentality is partially responsible for the higher relative consumption of uncoated woodfree paper.

The development of production facilities in North America has also provided a supply-led influence. Many BKP mills in the US were integrated during the last 10-20 years into very large and efficient uncoated woodfree facilities. Uncoated woodfree products are the most commodity oriented of the printing and writing grades, leading to expansions by production conscious North American producers.

Advertising trends, likewise, are affecting demand in the US in slightly different ways than in other parts of the world. The same fragmentation forces are at work in the US, which will also drive fragmentation in paper grades. A feature of the advertising situation unique to the US, however, is the near-saturation condition of US television. This is in contrast to television advertising in Western Europe, for example, where controls, and a gradual relaxation of these controls, on advertising time and content, has resulted in television increasing its share of total advertising expenditures. (Figure 1-22).

Figure 1-22
Television Advertising Share of Total Advertising Expenditures
(% share)

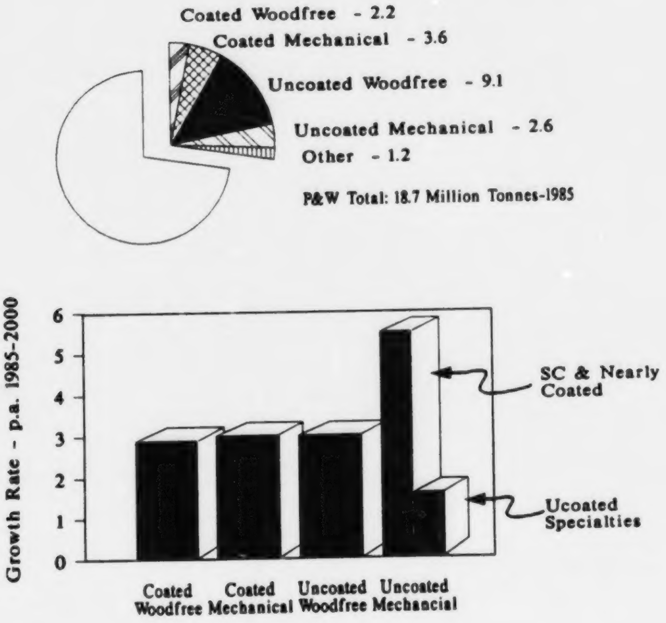


Source: ECC

In the US, the television share has also been increasing but at a slower rate. Direct mail in the US has been increasing its share over the same time period. At the same time, television advertising rates in the US were growing at a 9-12% pace compared to 2-3% rates for direct mail. The saturation in television advertising time (and therefore costs) in combination with the phenomenon of fragmentation in advertising, is expected to continue to drive high growth in demand for print media advertising and printing and writing paper.

Growth rates, nevertheless, will be constrained by overall economic activity and a continuation of historical growth rates is not anticipated. Growth in demand should be strong for those uncoated mechanical grades which are at the higher quality end of this historical designation, as the users of lower end grades and newsprint move to higher quality needs in this advertising fragmentation process. Consequently, the SC grades and other "nearly coated" products are expected to be the highest growth products in the printing and writing spectrum (Figure 1-23).

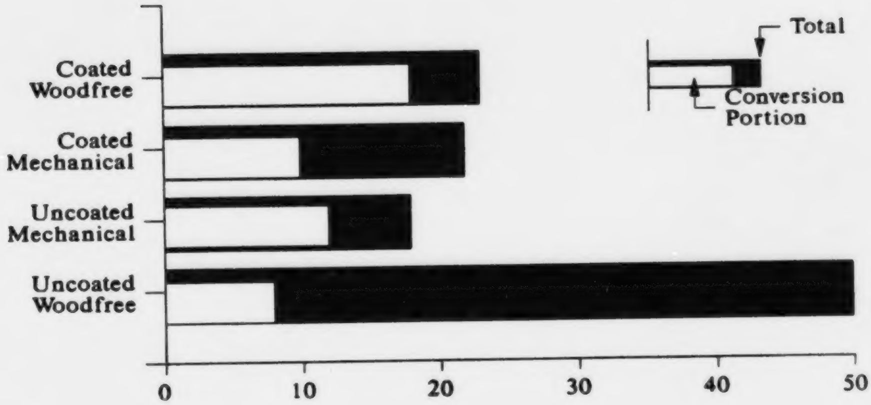
Figure 1-23
Printing & Writing Papers Growth
By Sub-Segment



Source: CIS, WRA Estimates

The 18-million-tonne total increase in printing and writing demand in the US over the next 20-25 years (Figure 1-18) is made more dramatic by considering the machine installations necessary to achieve this growth. Even considering an estimated 50 major conversions of older machines (e.g. smaller newsprint machines, expansion and upgrade of older existing printing and writing, etc.), a plausible scenario involves the installation of an additional 65 new machines (Figure 1-24).

Figure 1-24
Printing and Writing Capacity Expansion Requirements to Meet Incremental US Demand
(number of machines)



Note: Capacity assumptions:

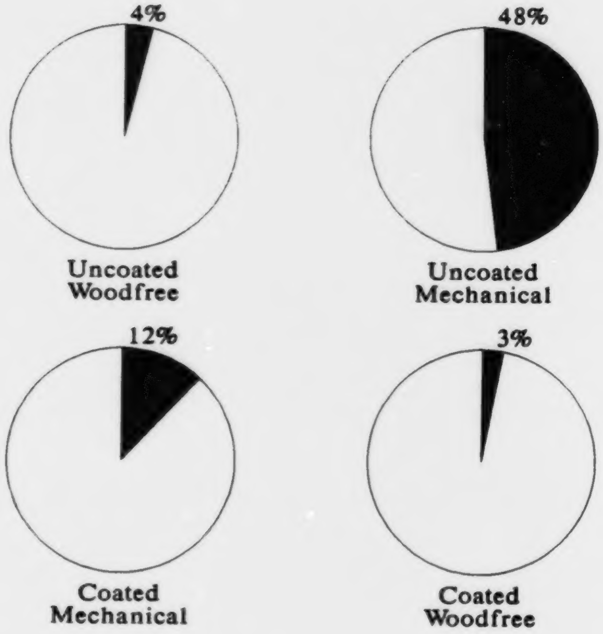
1. New mills - 200,000 tonnes per machine

2. Conversions
   - uncoated woodfree - 120,000 tonnes per machine
   - uncoated mechanical - 100,000 tonnes per machine
   - coated mechanical - 100,000 tonnes per machine
   - coated woodfree - 80,000 tonnes per machine

Source: WRA

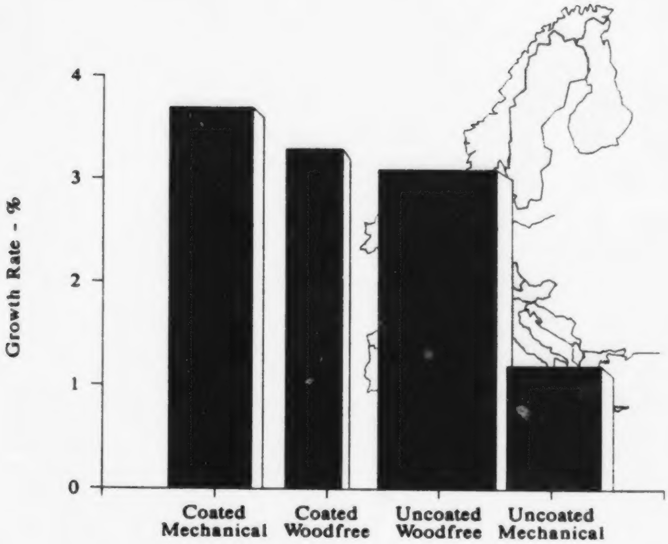
Domestic competition is generally strong in the US, especially in the uncoated woodfree and coated segments. US based producers have been less aggressive in the fast-growing SC and other uncoated mechanical categories however. Import dependence has been much higher for the lower value uncoated mechanical grades than any other category (Figure 1-25), much of which already comes from Canada. Notably, however, these imports from Canada are the lowest value - near newsprint grades.

Figure 1-25
US Import Dependence for Printing and Writing Papers
Imports as Percent of Consumption
(1985)



Source: RISI

Figure 1-26
Printing and Writing Papers In Western Europe
Size and Growth Rates By Segment



Note: Width of bars relate to relative size of market segments in 1985.

Source: ECC, WRA Estimates

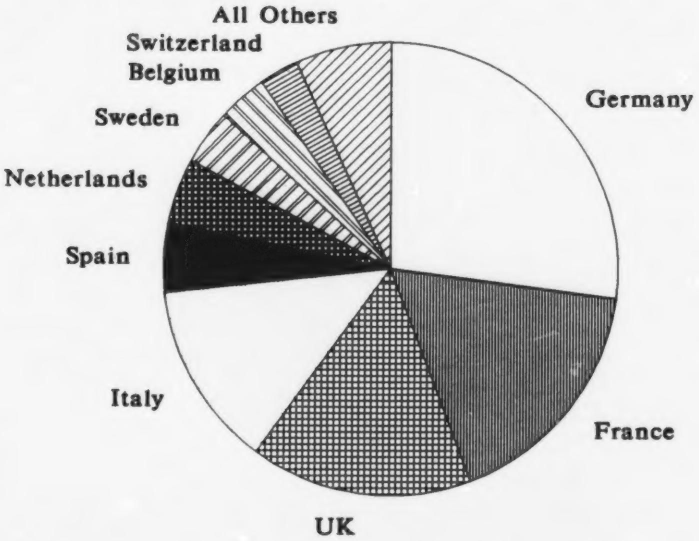
Western Europe

Western Europe represents only a minor opportunity at best for the Canadian industry. This market is characterized by slow growth in the uncoated mechanical sector, where the Canadian industry will enjoy its greatest strength. Also, a great deal of local competition from Nordic producers can be expected. The strategic advantages enjoyed in Canada for mechanical fibre-based grades are shared by the Nordic countries, and this makes meaningful progress in Europe difficult for Canadian producers.

The size of the Western European market for printing and writing papers is large, but fragmented between many countries (Figure 1-27). The market size for any individual country therefore is relatively small and more difficult to access.

Figure 1-27

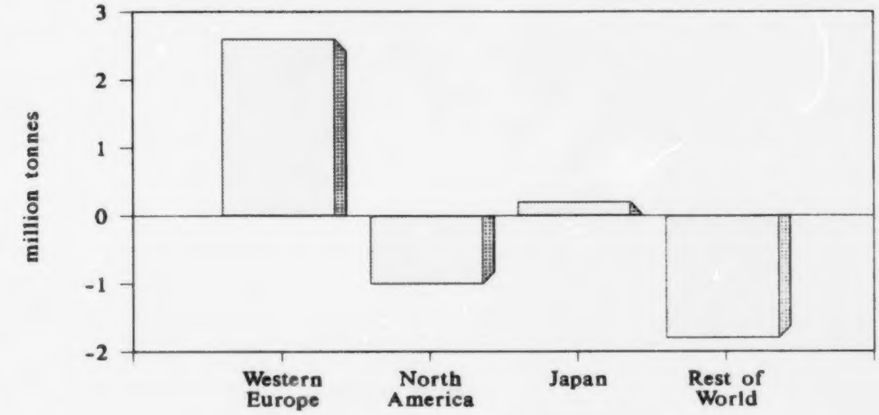
Printing and Writing Consumption in Western Europe
Breakdown By Country



Source: [illegible]

Wes[illegible] Europe is also the world's major net exporter of printing and writing papers, accounting for virtually all of the global net export trade (Figure 1-28).

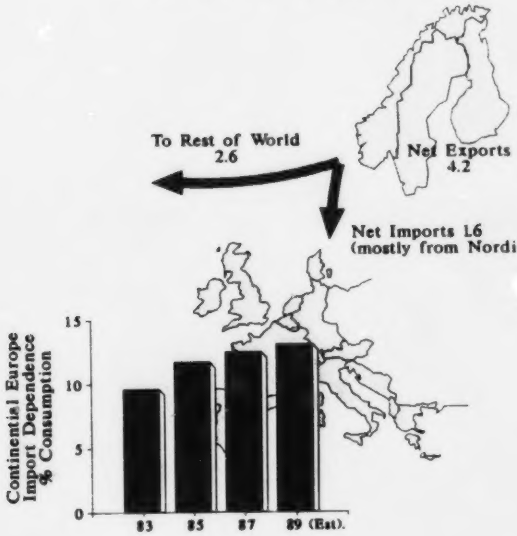
Figure 1-28
Printing and Writing Papers
Net Exports by Major Region
(1985)



Source: RISI

While Western Europe, as a whole, is a net exporter, Continental Europe is a net importer. The Nordic countries provide most of the imports (Figure 1-29).

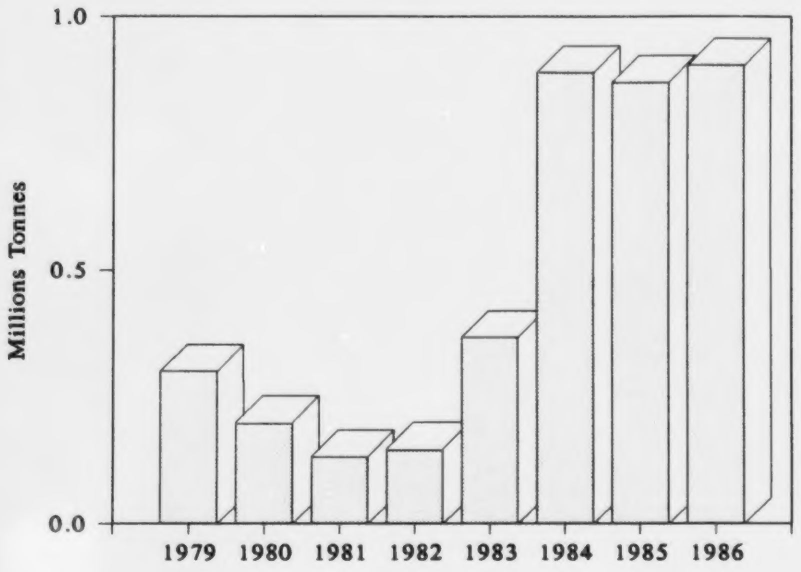
Figure 1-29
Import Dependence Trade Flows In Western Europe
Printing and Writing Papers
(millions of tonnes - 1985)


Net Exports 4.2
To Rest of World 2.6
Net Imports 1.6 (mostly from Nordic)
Continential Europe Import Dependence % Consumption
15
10
5
0
83
85
87
89 (Est).

Source: RISI

Furthermore, most of the total exports from Western Europe (most of which are actually from Nordic countries) are destined for North America. Western Europe has, in fact, increased its exports to North America over the past decade to almost one million tonnes by 1986 (Figure 1-30).

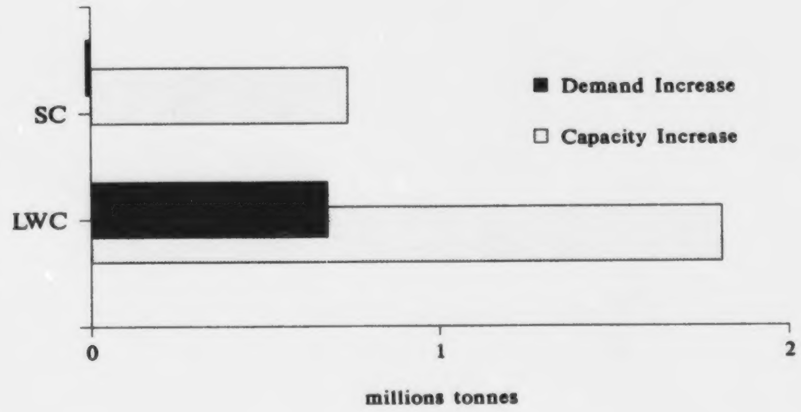
Figure 1-30
Western Europe Gross Exports of Printing and Writing Papers to USA
(millions of tonnes)



Source: ECC, DECD, API

Despite the fact that Continental Europe is a net importer, and is forecast to become more so, Nordic producers are adopting an aggressive stance in printing and writing grades with overexpansion in segments like LWC. Figure 1-31 shows that capacity expansions in LWC and SC papers over the 1985-1990 time period is well in excess of expected demand increases over the same period. SC demand in Europe, in fact, is stagnant, while capacity expansions of over 700,000 tonnes are planned or announced.

Figure 1-31
Capacity vs. Demand Increments
LWC and SC in Western Europe
(1985-1990)

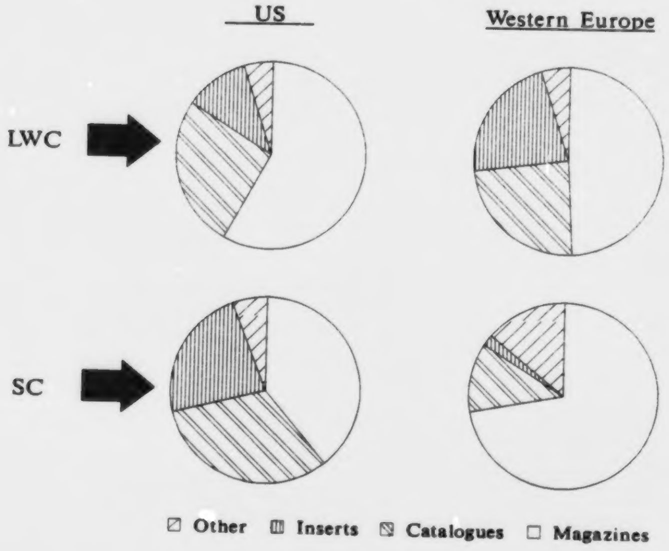


Source: EPI

The expansion in LWC is consistent with the rapid growth rate expected in coated mechanical grades (Figure 1-26) relative to the other printing and writing segments. Uncoated mechanical grades are growing slowly, however, and SC particularly so. These growth trends are in contrast with the US market where SC and similar grades are the most rapidly growing of the printing and writing segments. Clearly, the expansions in Europe are made with the US market outlook in mind.

The driving force behind the differences between Western Europe and North America is related to historical use of these grades in the various end-use applications. Magazines have historically been the major end-use for SC in Europe, while LWC was more popular in catalogues and other non-magazine printed advertising vehicles. This is just the opposite in the US, where LWC has always been the major grade used in magazines, while uncoated mechanical grades have been used in catalogues. More recently, SC has gained popularity in other advertising vehicles like inserts and flyers (Figure 1-32).

Figure 1-32
End Use Profile - LWC and SC
US vs. Western Europe
(1986)



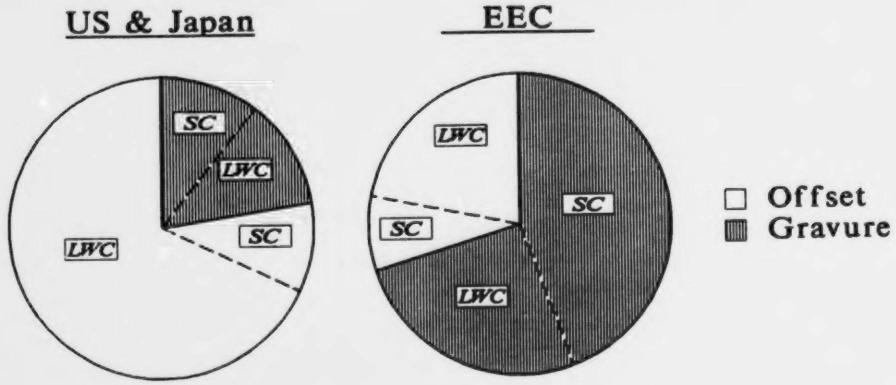
Source: CIS, Jaakko Poyry

The advertising trends that are causing this paper grade fragmentation and product upgrading support these differences between Europe and the US. Magazines in Europe, traditionally printed on SC are now moving up to LWC. Flyers and catalogues, traditionally printed on lower quality uncoated mechanical grades in the US, are moving up to SC. Growth in the insert and flyer end-uses is high in both regions, and is a primary driving force behind these shifts.

The shift in Europe from SC to LWC also has a dimension related to the mix of printing methods employed. Gravure printing (most economical for long run printing) has been a dominant process for the high volume consumer magazine industry. SC grades were developed in Europe specifically for the peculiar printing demands of the gravure process. LWC, on the other hand, was developed with more of a North American bias for the offset printing method (Figure 1-33). The fragmentation of the magazine industry (and other printed end-uses) has led to the increased use of offset printing which is a more economical printing process for shorter runs. This, in turn, is also driving the growth in LWC because of its better suitability to the offset printing process.

Today, variations of SC and LWC are constantly being developed for both printing processes further feeding the paper grade fragmentation phenomenon.

Figure 1-33
Printing Methods Used for LWC and SC
Europe vs. Japan/US



Source: PPI's Third Publication Papers Conference,
Strategies and Internationalization for Uncoated
Groundwood Papers - Rauma-Repola

The same forces to upgrade printing quality to more four colour printing are also affecting the uncoated woodfree sector in Western Europe. This relatively large printing paper component is moving more towards coated grades to achieve the much-improved print quality of the four colour process.

The office use driving force is very strong in Europe, with copiers, laser printers, etc. still in a high growth phase. The lower growth in printing end-uses is counterbalancing the high growth in office end-uses, resulting in only "normal" growth expectations for uncoated woodfree grades, as a whole.

There is also a noticeable shift in many traditional end-uses from uncoated woodfree grades to more mixed furnish products containing significant quantities of mechanical pulps, as was discussed earlier in this chapter. The short-life phenomenon, as well as a supply push factor (i.e. cost), most evident from many European suppliers, is breaking the traditional woodfree mentality barrier more quickly in Europe than in North America.

Nordic producers, with their high wood costs, are being forced to innovate to bridge the technological gap. As an example, CTMP is emerging as a popular mechanical pulp that gives many of the traditional woodfree characteristics of brightness and colour stability to which the office end-users have become accustomed.

Nordic Corporate Concentration

While Western European producers are increasing their competitive presence (both in the European and North American markets) with increased capacity in LWC and SC, they are also building their competitive strength through corporate concentration.

The main driving force behind this growing European corporate concentration is the realization that international competition is getting tougher, and only large, highly integrated companies will be able to successfully compete.

This corporate concentration has intensified significantly over the past several years, especially in the Nordic block. Stated simply, the Swedish and Finnish companies are consolidating, not out of weakness, but out of concern for the future. The Nordic firms appear to have two major objectives in their merger activity:

- to establish a strong foothold in the European Economic Community (EEC) in advance of the move to a single internal market in 1992;
- to reduce their dependence on the highly cyclical pulp business by extending their operations downstream, particularly into consumer products.

Today's pulp and paper industry in Sweden is dominated by three very large companies or "blocs": Stora, SCA and MoDo. All three have been actively expanding.

Stora, Sweden's largest pulp and paper company, recently bid US $1 billion for Swedish Match which is primarily involved in packaging, consumer products, building materials and, of course, matches. This follows Stora's acquisitions in September 1986 of domestic rival Papyrus (pulp, printing and writing papers, board and newsprint), and in September 1984 of Billerud, a large Swedish packaging producer. The Swedish Match deal gives Stora tremendous opportunities to exploit Swedish Match's diversified operations in Continental Europe.

In March 1988, MoDo bid more than US $1 billion for the outstanding shares in Holmen and Iggesund to create a "third bloc" in the Swedish industry. The merger would create the second largest pulp and paper company in Sweden, after Stora, with net sales in 1987 of close to US $2.75 billion. The new company would be involved in uncoated woodfree papers (MoDo), newsprint and tissue (Holmen), and board and packaging (Iggesund), as well as hygiene products.

Through earlier acquisitions, Holmen also has a 25% stake in MD Papier, a West German LWC producer and a joint venture nonwovens agreement with James River Corp. In 1987, Iggesund bought Britain's Thames Board Covington mill which makes high quality duplex cartonboard. The rationale behind the MoDo-Holmen-Iggesund merger is to pool resources in order to face growing international competition.

Svenska Cellulosa (SCA), which until the MoDo deal was the second largest company in Sweden, has moved the furthest along this route toward consumer products. Earlier this year, it acquired Peaudouce, the leading French disposable diaper producer, for US $346 million. The deal gives SCA a leading position in France, as well as access to such underexploited markets within the EEC, as Greece. The acquisition also fits in with SCA's large hygiene products division, Molnlycke, which last year was more profitable than SCA's considerable pulp and paper operations.

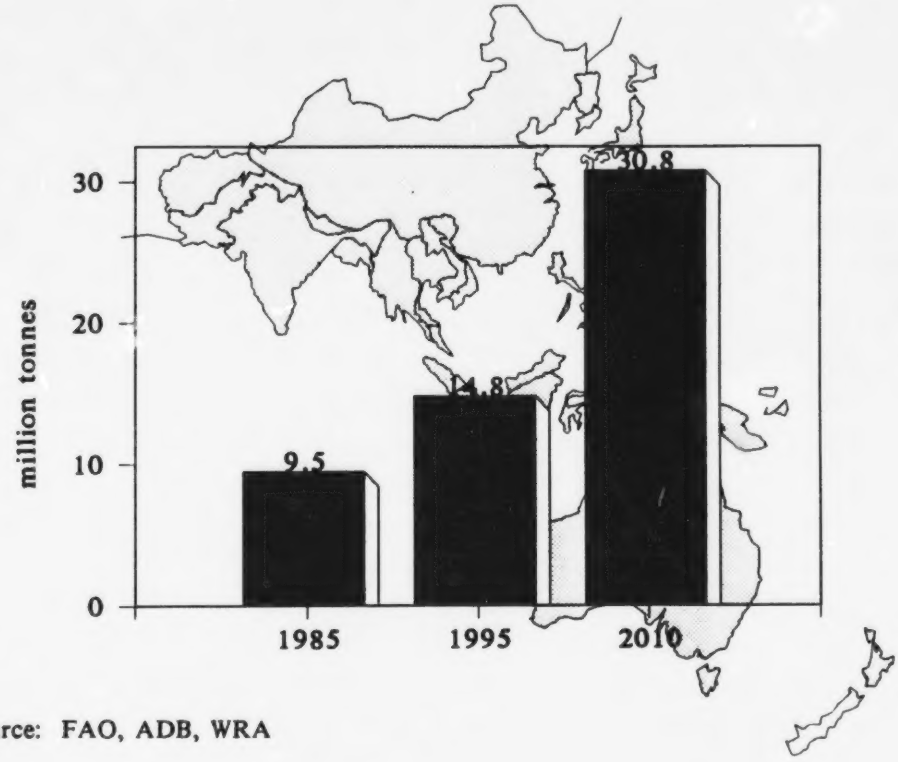
These strategic moves will enable the Swedish producers to offer a wide range of products within the EEC, the money to invest in the most modern, lowest cost mills, as well as the muscle to tackle the large North American firms such as James River, Scott and Kimberly-Clark which are moving into Europe as well.

In Finland, four major deals have taken place over the past two years, the biggest being the Kymmene/Kaukas/Schaumann merger which created a large, highly integrated company with net sales of roughly US $2.25 billion. The Finnish firms have also been active in setting up production facilities in the EEC; one newsprint and one LWC mill in England and recently a takeover of a pulp mill in France.

Asia-Pacific

This region is considered the most rapidly growing region in the world and one of the most import-dependent for pulp and paper products. As such it represents a significant opportunity for Canadian exporters of such products as P&W papers. Rapid economic growth will triple the consumption of P&W papers by the year 2010 (Figure 1-34).

Figure 1-34
Consumption of P&W Papers
Asia-Pacific
(millions of tonnes)

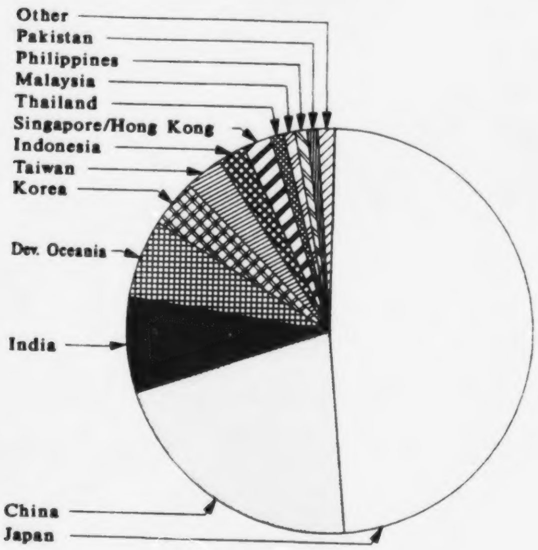


Source: FAO, ADB, WRA

While consumption will increase dramatically, the opportunity will not be realized easily, as this market is very conscious of quality and service considerations. Despite a probable need for large quantities of imports, many countries have a penchant for self-sufficiency, particularly in higher valued products like P&W papers. Opportunity may often be realized, therefore, through joint venture arrangements with local suppliers and/or end-users.

The total consumption of P&W in the entire region amounted to just under 10 million tonnes in 1985 but was concentrated in Japan, accounting for almost half of the total (Figure 1-35).

Figure 1-35
P&W Demand in Asia-Pacific
Breakdown by Country
(1985)

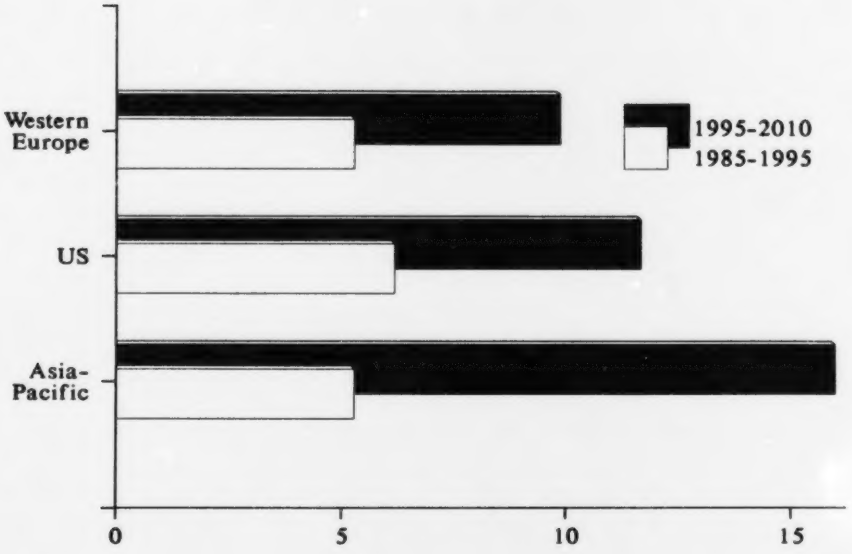


Total - 9.5 million tonnes

Source: FAO, ADB

Consumption in Japan, in fact, is the second highest in the world, albeit considerably less than the almost 19 million tonnes in the US market. Absolute incremental demand in the entire Asia-Pacific region over the next 25 years, however, will outdistance even the large US marketplace (Figure 1-36).

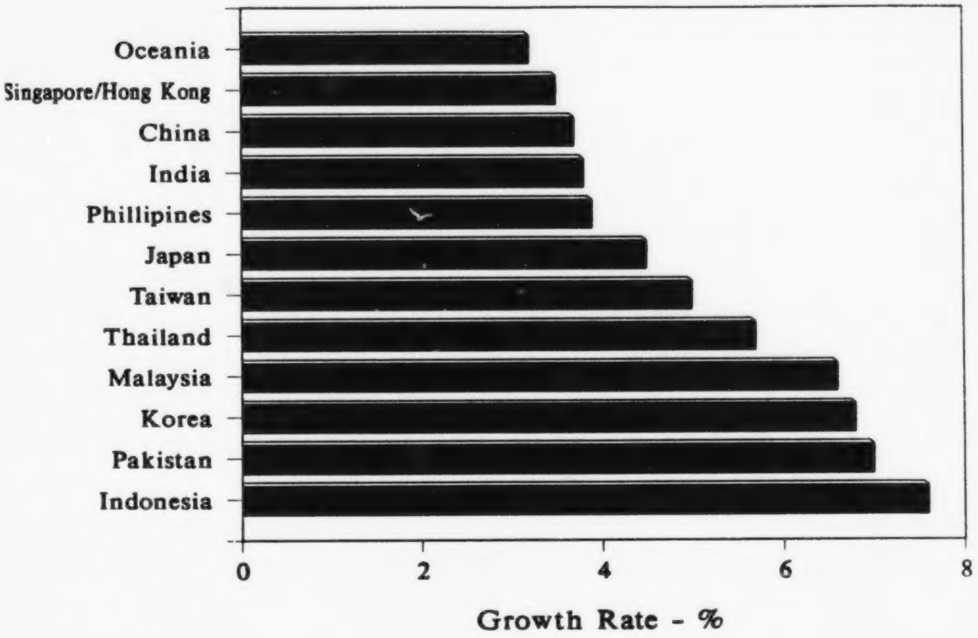
Figure 1-36
Incremental Demand for P&W Papers
Asia-Pacific vs. Other Regions
(millions of tonnes)



Source: ADB, FAO, WRA Estimates

Growth rates among the various countries will also vary, with some of the more developed countries like Singapore and Hong Kong growing less rapidly than others like Indonesia and Korea. Japan stands out as a market that is both large and continues to grow quite rapidly (Figure 1-37).

Figure 1-37
Growth Rates In P&W Papers - Asia-Pacific
Breakdown by Country
(1985 - 2010)



Source: ADB, WRA Estimates

Japan

The Japanese market typifies many of the other countries in the Asia-Pacific region in terms of trends and requirements of the marketplace and, to some extent, can serve as a model for detailed analysis of the entire region. Commentary will be made on some of the other countries as well, but in less detail.

The driving forces behind the ongoing developments in Japan parallel those in US and Europe in some respects while differing significantly in others. As in the preceding market areas, the trend towards more full colour printing in advertising is driving more coated paper consumption in a variety of general printing applications. Likewise, the proliferation of office related end-uses continues to drive consumption in uncoated papers.

The Japanese market is more progressive in terms of both developing and adopting new products that provide the end-user with real benefits. There is less adherence to the historical woodfree and mechanical fibre distinctions, for example. There is also more willingness to use the economic or performance advantages of mechanical fibre without pre-conceived ideas of the quality connotations.

The grade structure for P&W grades in Japan is different from the US or European markets. Uncoated printing papers are broken down into a number of different categories as follows:

- *A grade - 100% chemical pulp*
- *B grade - over 70% chemical pulp*
- *C grade - 40 - 70% chemical pulp*
- *D grade - less than 40% chemical pulp*

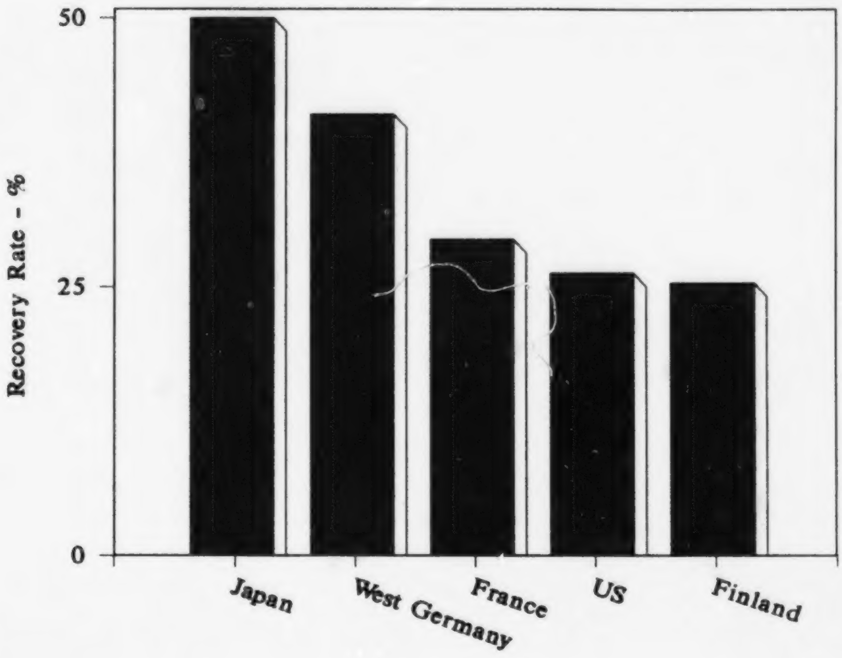
Also, coated papers are broken down by coat weight as follows:

- *Art paper - more than 20 g/m² per side*
- *Coated paper - 10 -19.9 g/m² per side*
- *Light weight coated - less than 9.9 g/m² per side*

While there is clearly still an alignment of quality level with the degree of chemical pulp there is far greater recognition of mixed fibre products in the overall grade structure.

Another facet of the Japanese industry is the extensive use of recycled fibre. The recovery rate of wastepaper is about 50%, almost double that of most paper producing regions (Figure 1-38).

Figure 1-38
Recovery Rate of Wastepaper
Major Paper Producing Regions
(1985)



Source: Pulp & Paper International

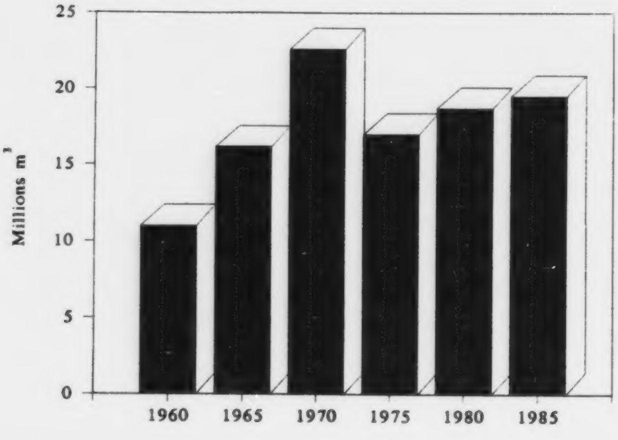
The point is, the Japanese market is accustomed to improvising with fibre, and fibre substitutes, to achieve the most economical means to arrive at the paper characteristics needed. Hence the market is more conditioned to accepting new and better ways to achieve the desired end product. In the same way, the product fragmentation that is relatively new to the rest of the world has been more a way of life in this market. Again, the acceptance of these new variations on historical products is more readily accepted by this market.

The result of these dynamics has been quite dramatic. Over the past decade, for example, coated grades have grown 86%, compared to only 49% for uncoated grades. Within the coated category, light weight coated grades with a high proportion of mechanical fibre have grown the most rapidly. Likewise, the mixed furnish "B grade" of uncoated paper has experienced the most rapid growth. During the period from 1976 to 1986, "B grades grew at a rate of over 13%, while the pure woodfree "A grade" actually declined marginally. The uncoated "B grade" now accounts for almost one million tonnes of paper or 33% of all uncoated P&W papers.

While this trend is not expected to persist at this pace into the future, the Japanese market will continue to grow rapidly in the mechanical and mixed furnish products.

There are other aspects of the Japanese industry that will affect the potential opportunity for Canadian producers. Japan reached its limit of fibre supply (Figure 1-39) some time ago and has been importing fibre in a variety of forms for a number of years.

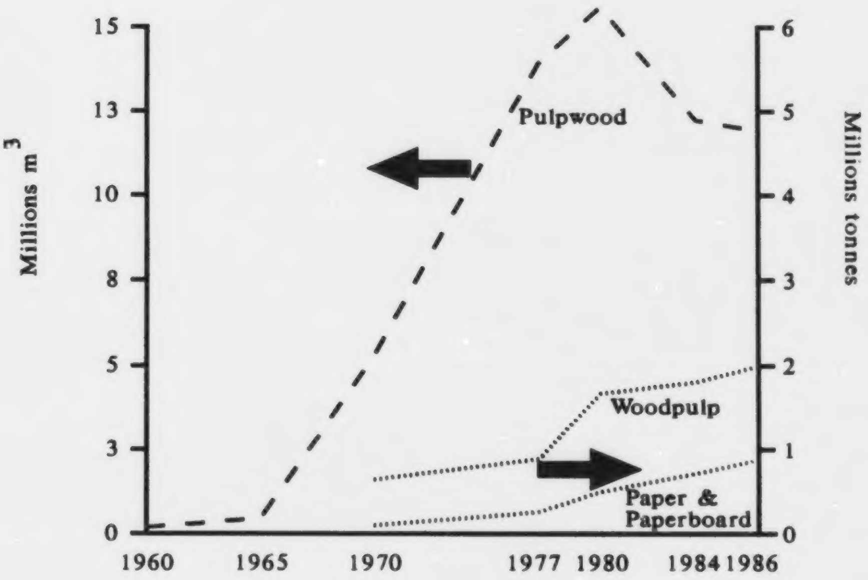
Figure 1-39
Domestic Supply of Pulpwood
Japan Pulp & Paper Industry
(millions of tonnes)



Source: Japan Paper Association

Japan has traditionally imported the lowest valued commodity available to the industry, preserving the value-added component for the domestic industry. In the early years of fibre shortage it imported pulpwood, then progressively more woodpulp, and finally increasing quantities of paper and paperboard (Figure 1-40).

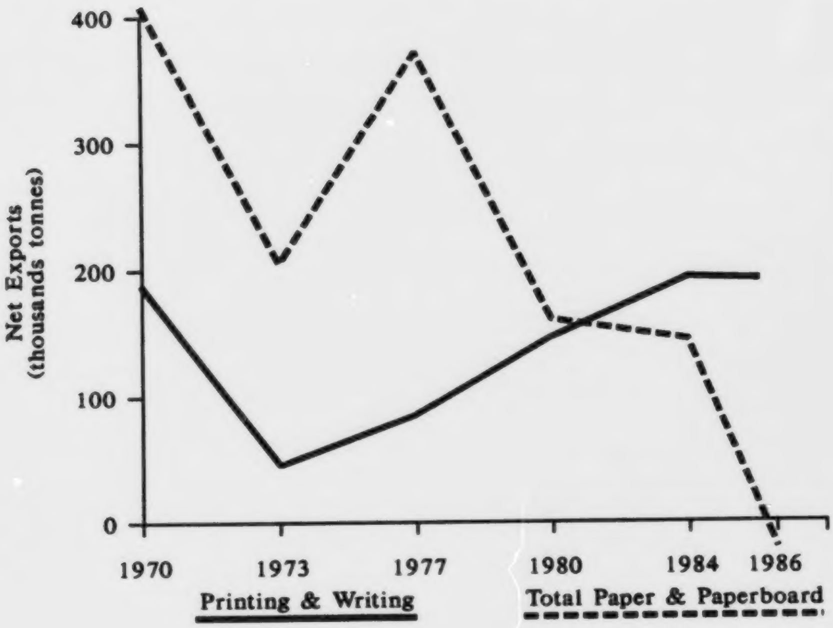
Figure 1-40
Japan Import Trends
Pulpwood, Woodpulp and Paper & Paperboard



Source: Japan Paper Association

In the same way, while Japan's net export position has been declining for paper and paperboard in total (and in fact was a net importer in 1986 for the first time ever), it has continued to be a net exporter of P&W paper (Figure 1-41). This serves to further point to Japan's continuing efforts to maximize the value-added portion of the products that are manufactured domestically.

Figure 1-41
Japan Net Export History
P&W vs Total Paper and Paperboard



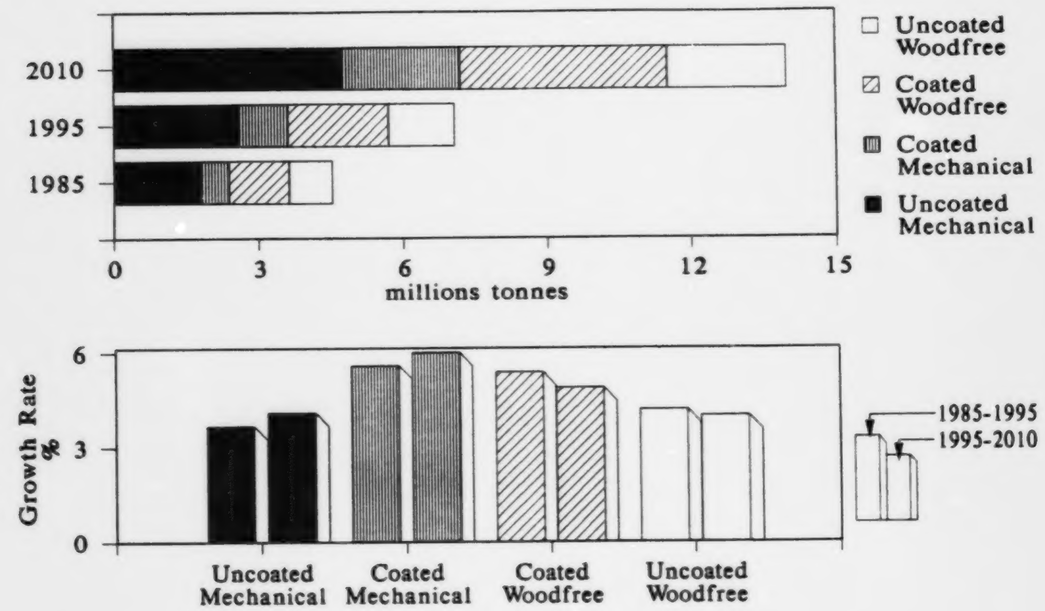
Source: Japan Paper Association

Consequently, while the demand for P&W papers is projected to increase significantly over the forecast period, Japan will undoubtedly attempt to supply as much of the higher value-added portion as possible from domestic sources. Mechanical grades, however, will grow as fast or faster than woodfree grades (Figure 1-42), and in absolute terms will provide most of the growth. Domestic supply has tended to be concentrated in the higher value woodfree grades; this could lead to a supply-led push in demand for woodfree papers that will tend to level the growth balance between mechanical grades and woodfree products. (Figure 1-42).

Figure 1-42

Japan Printing & Writing Papers Projected Consumption 1995 & 2010

(millions of tonnes)

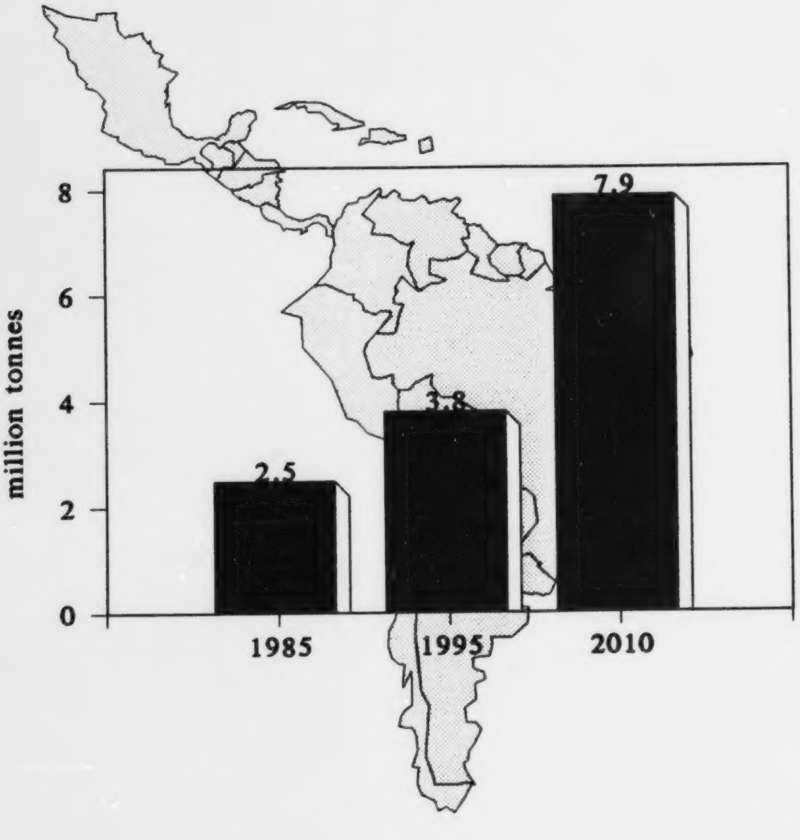


Source: ADB, JPA, WRA Estimates

Latin America

Latin America will not provide a market opportunity for Canada in the foreseeable future. Despite very rapid growth in demand for printing and writing papers (Figure 1-43), domestic supply will continue to service this growing demand. At the same time, the domestic industry could pose a serious competitive threat to Canada in the international marketplace.

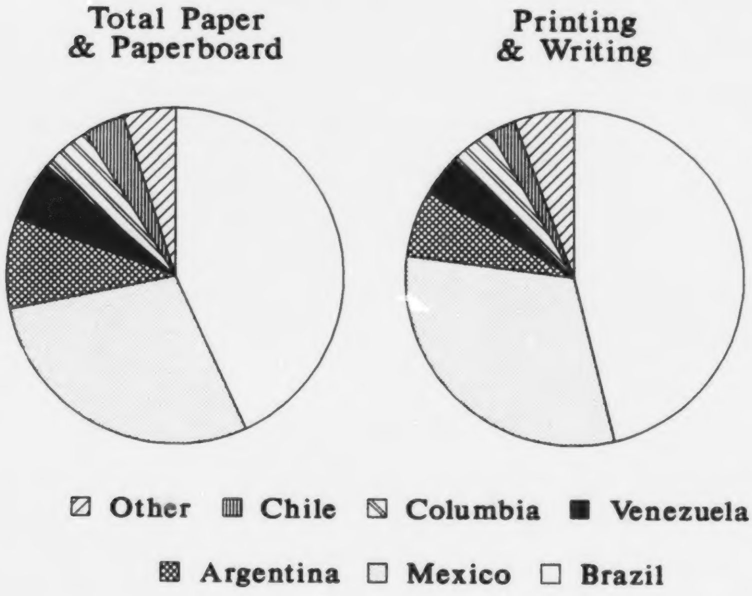
Figure 1-43
Demand for Printing and Writing Paper
Latin America
(millions of tonnes)



Source: FAO, WRA Estimates

Brazil is the largest of the Latin American producers of paper and paperboard (Figure 1-44) and will be used to typify conditions which exist in most of the individual countries.

Figure 1-44
Production of Paper and Paperboard
Latin America

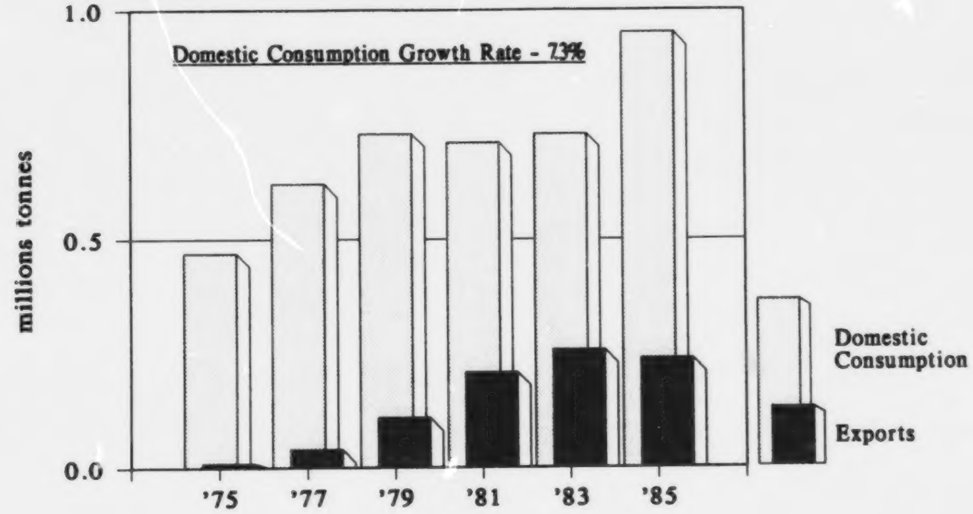


Source: FAO

Brazil

The pulp and paper industry in Brazil has declared itself as a market pulp exporter. To a large degree, paper is seen as a domestic consumer of pulp, tapping its ability to earn valuable export earnings from pulp. Paper, and particularly printing and writing paper domestic consumption, has grown rapidly over the past decade (Figure 1-45).

Figure 1-45
Brazil - Domestic Consumption of Printing and Writing Papers



Source: FAO

As shown, however, exports of printing and writing papers have also grown rapidly as domestic producers integrate for export, as well as for domestic consumption.

A primary driving force behind the structure and behaviour of the industry in Brazil relates back to the debt problems that plague many of the Latin American producing countries. Pulp is seen as the easiest method of earning foreign exchange, providing a favourable ratio of export revenue to capital investment. At the same time, producers must minimize imports. With domestic demand for paper on the increase, producers are compelled to retain increasing quantities of pulp within the country to produce paper. Integration, to date, has largely been directed towards the avoidance of imports rather than planned exports. The entire process has been distorted by domestic pricing policies as well, which fix domestic pulp and paper prices at well under international market prices. Consequently, neither domestic demand nor export opportunity has been tested by free market conditions.

The market for printing and writing grades is likely to remain protected as long as the debt problem persists. Brazil has the potential to be a major competitive force in printing and writing papers, however, and this should shape, to some extent, Canada's strategic agenda.

Most of the printing and writing papers produced in Brazil (more than 75%) are uncoated woodfree, using virtually 100% hardwood eucalyptus pulp. Brazil enjoys the same cost competitive advantage (based on lower wood costs) in woodfree paper grades as it does in market pulp. While some express the opinion that large scale integration into P&W papers would only serve to destroy the existing production base, which consists of many small mills, others feel that Brazil will find means to protect the existing industry as the country begins to realize the higher value associated with the export of printing and writing papers.

Coated mechanical papers, so popular in other parts of the world, are less developed in Latin America, with only one LWC machine in Brazil (Monte Alegre) producing a mere 50,000 tonnes. LWC will likely grow rapidly from this small base as its superior printing characteristics gain widespread recognition. Woodfree grades will hold the spotlight in Latin America, however, based on the wood intensive cost advantage enjoyed by this fast-growing wood plantation region.

Canada's Competitive Position in Printing & Writing Papers

The industry in Canada can be characterized as having the basic requirements to become a highly competitive industry, particularly in products that use mechanical pulps. The industry, in the past, has consisted of a number of low output mills, many of which still produce mostly semi-commodity type products. More recently, a number of modern facilities have been completed or announced, giving the industry a polarized appearance with a mixture of both small and large machines.

As was pointed out earlier, the Canadian printing and writing industry has largely been protected by tariff barriers resulting from smaller mills producing a fragmented product mix. Some rationalization of products has occurred in many of these older mills following the lowering of tariffs over the past decade.

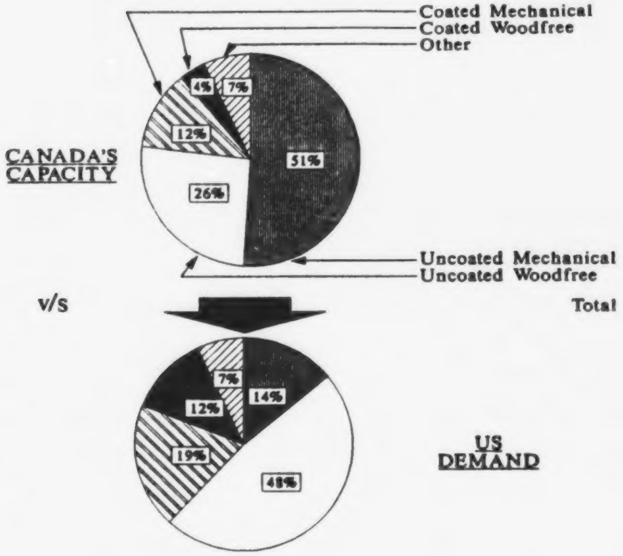
A continued effort to move in the direction of specialization and higher valued products will be needed to ensure the survival of many of these mills.

Industry in Profile

Printing and writing papers are produced in over 30 different mills across Canada, most of which either fall into the category of newsprint mills which have been converted to produce uncoated mechanical printing and writing grades (e.g. MacMillan Bloedel-Powell River, Consolidated Bathurst - Trois Rivieres), or small scale specialty mills producing printing and writing products (e.g. Domtar-Toronto, St. Catharines).

Over half of the capacity is devoted to uncoated mechanical grades, in sharp contrast with the North American demand profile for this segment (Figure 1-46).

Figure 1-46
Capacity Profile - Canada vs. US Demand
Printing and Writing Papers
(1987)



Source: CPPA, RISI, WRA Data Bank, CIS

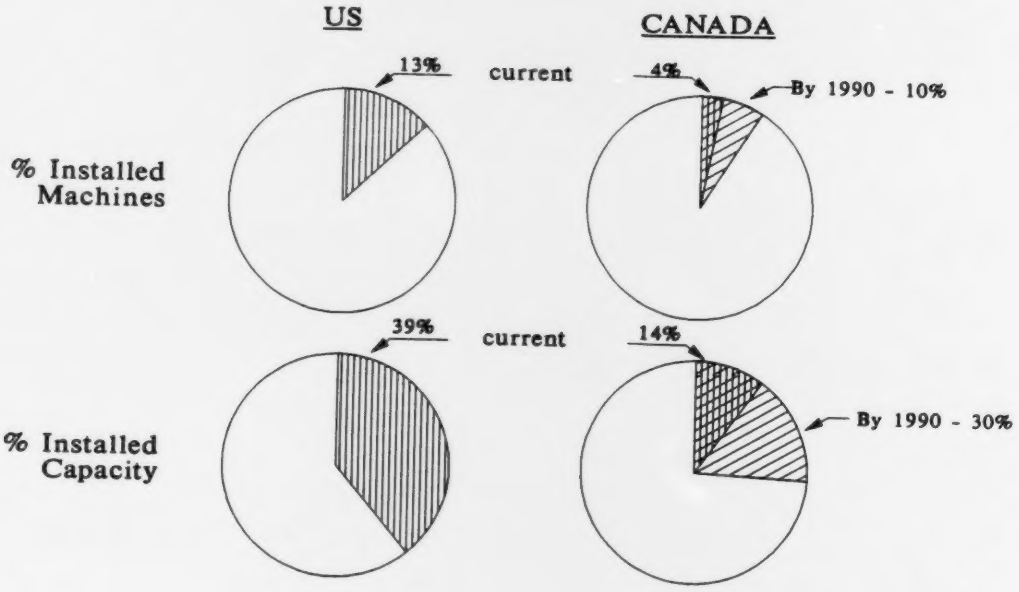
Within the uncoated mechanical segment, Canada has only a small portion of the total in the higher quality SC categories (estimated 10-15%). The majority of the remainder falls into near-newsprint products such as roto, bulky news, directory, etc.

> *There is some confusion and conflict in the classification of capacity and shipments of Canadian printing and writing papers. A significant quantity of newsprint capacity is "swing tonnage", capable of producing either newsprint or uncoated mechanical grades. Furthermore, a meaningful quantity of exports of uncoated mechanical products are classified as newsprint for customs purposes since the product does, in fact, get used in newsprint applications. A further complication is the categorization of printing and writing grades by CPPA, which provide statistics in three categories defined as follows:*
>
> - *groundwood printing and specialty*
> - *other book and printing*
> - *fine papers*

> *The correlation of these categories with the printing and writing breakdown used throughout this report is not well defined. The tracing of capacity and shipments of all categories is inexact, but especially so for the uncoated mechanical portion.*
>
> *It is estimated by various data collection bodies that 600,000 to 800,000 tonnes of uncoated mechanical products are, in fact, included in the statistics for newsprint. The capacity and shipments of printing and writing papers (and uncoated mechanical grades specifically) used herein are based on the best available data to the consultants as to the actual practice rather than the official reported statistics.*

Canada still lags behind its major competitor, the US, in terms of modern installations, despite some recent world-scale capacity additions. Three new machines in Canada in the 1980s (GLFP-Dryden, Repap-Miramichi, Domtar-Windsor) are the only dedicated P&W machines producing in excess of 100,000 tpy, while US producers have 55 machines in this size category (Figure 1-47).

Figure 1-47
Large Paper Machine Installations - % Over 100,000 tpy
US vs. Canada - Printing and Writing Paper - 1987



Source: API, WRA Data Bank

The situation will have improved by 1990 with five new machines being planned in Canada (Table 1-1).

Table 1-1
Planned Printing and Writing - New Machines
Over 100,000 tpy

Installation	Start-Up	Product*	Capacity (000 tonnes)
St. Marys - Sault Ste. Marie	1988	SC-A	135
Consolidated Bathurst-Grand Mere	1990	SC-A	183
Domtar, Windsor	1989	U-WF	114**
Great Lakes, Dryden	1989	U-WF	175
Weyerhaeuser, Prince Albert	1988	U-WF	181

* SC-A - Uncoated Mechanical
U-WF - Uncoated Woodfree

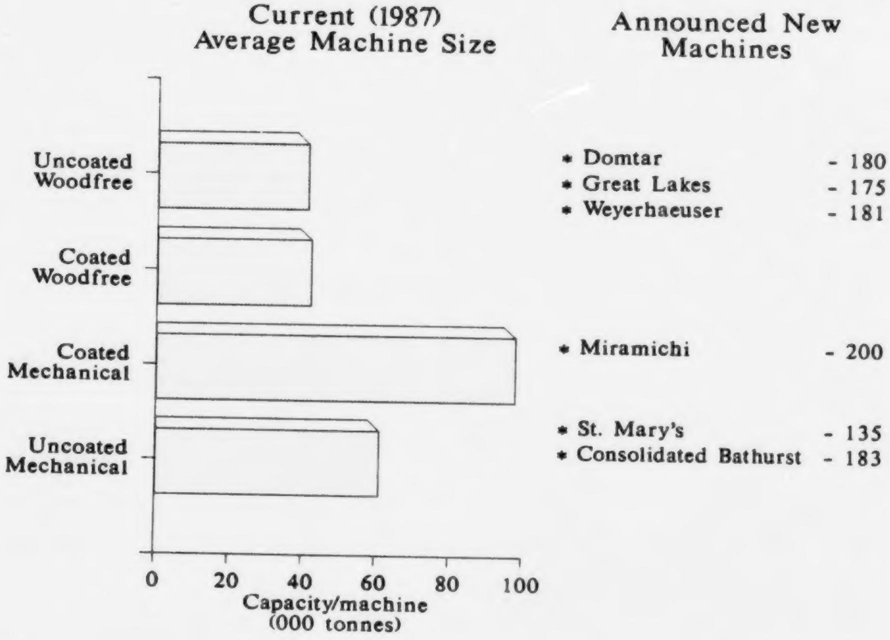
** Net increase in capacity, machine output will be 180,000 tonnes

Source: Pulp and Paper, Project Report, January, 1988

These capacity additions will improve Canada's "average" competitive position where it is needed the most. The uncoated mechanical and uncoated woodfree sectors are characterized by small machines, yet produce the more commodity oriented products (Figure 1-48). The addition of new machines, of course, does not improve the position of the old machines. Clearly, the smaller machines will need to eventually move further up the value-added scale, say into coated grades, or be replaced by new machines in the long term.

Canada's preoccupation with the uncoated mechanical segment of printing and writing is not without reason. There are a large number of small scale newsprint machines which can realize improved margins through product upgrading with only modest capital outlay. The combination of low cost power in most regions of Canada, together with relatively high wood costs, make the cost-competitive position of these products attractive, when compared to newsprint.

Figure 1-48
Average Machine Size
Canadian Printing & Writing Paper Mills



Source: WRA Data Bank, Post's Pulp & Paper Directory

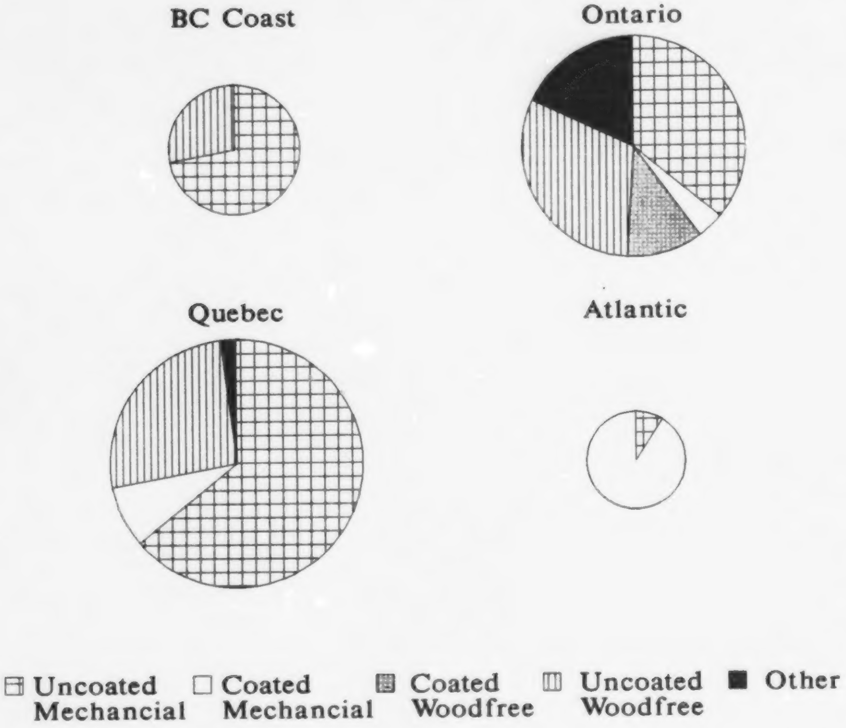
Scale and cost are not everything as these specialty products can find segments of end-uses that require specific characteristics. Many producers have been able to find such end-uses, even in the lower quality end of the uncoated mechanical spectrum of products. Market analysis has pointed towards an upscale movement in the range of activity, into the SC and lightly coated end of the spectrum. Many of the current machines are candidates for this further upscaling activity, prolonging the life of these assets even further.

The competitive position of many uncoated woodfree installations is less encouraging. A major factor is the lack of integration with the pulp supply. On average, Canada's producers rely on market pulp (or at least dried and transferred) for more than half their needs. Their US counterparts, for example, are about 75% integrated.

The recent capacity additions (i.e. GLFP, Dryden) were built, in part, to achieve integration of market pulp. Many older mills, however, do not have the same opportunity. Integration of these non-integrated P&W mills through affiliation with pulp producing operations is an alternative and corporate concentration activity is providing this pulp supply link for a number of these mills. Those operations with small machines, which are neither integrated nor affiliated with pulp supply, are particularly vulnerable. Alternatives include further specialization and/or further upgrading to coated woodfree products. The latter, of course, is also considered an attractive market-led opportunity for Canadian producers.

Most of the P&W capacity is in Ontario and Quebec which together account for over 80% of the total. The Prairies and BC Interior have no capacity, although a new uncoated woodfree machine at Prince Albert is scheduled for start-up in 1988. Ontario is the most diversified of the regions and the only region with capacity in all the major sub-segments of P&W papers. It is also the only region with any coated woodfree capacity. Quebec is heavily oriented towards uncoated mechanical, almost 2/3 of the total. Atlantic Canada is dominated by the single new coated mechanical installation at Miramichi (see Figure 1-49).

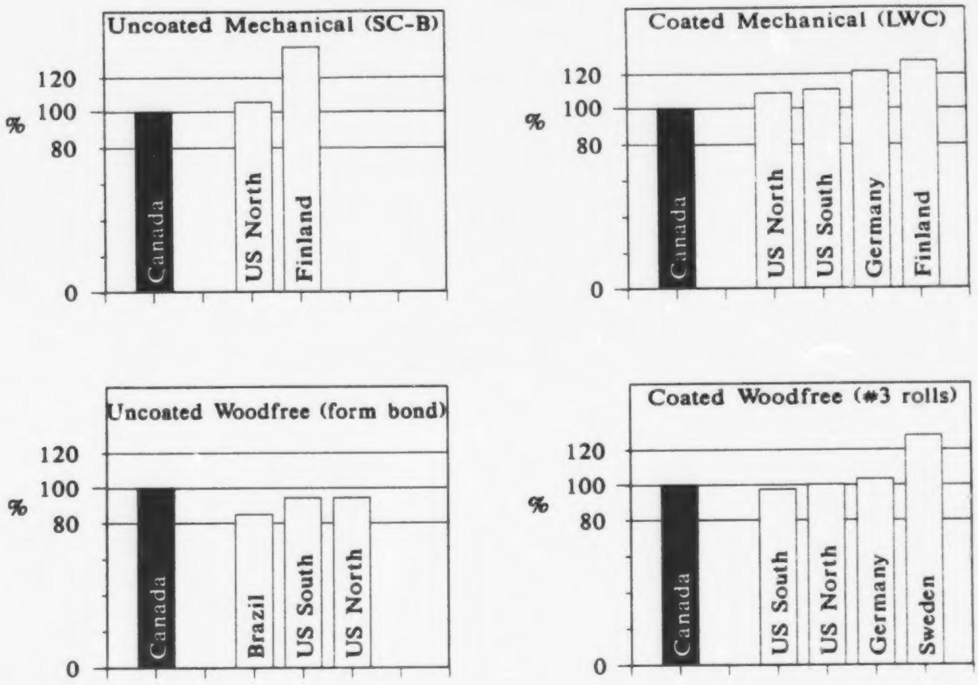
Figure 1-49
Printing & Writing Papers
Sub-segment Breakdown by Region



Source: CPPA, WRA Data Base

Canada's cost-competitive position for new integrated installations ranges from moderately favourable to quite favourable, depending on the segment (Figure 1-50).

Figure 1-50
Canada's Cost-Competitive Position
Printing and Writing Papers - New Integrated Mills
(Relative Cost/Tonne - Canada = 100%)



Note: Regions chosen for comparison, based on most probable competitive threat expected in the future.

Source: Temanex, Price Waterhouse, WRA Data Base.

The impact of competitive power costs and high wood costs favour the mechanical fibre-based grades as would be expected. Consequently, Canada should enjoy a favourable position in products like SC-B and LWC.

The more detailed analysis outlined in a separate volume of this report indicates that the existing cost structure that favours the mechanical fibre-based grades is likely to persist in the future, providing Canada with a long-term strategic cost advantage pillar.

Low cost competitive pressure will be more acute for woodfree grades, particularly from Brazil, which has the potential to be a major threat in these grades. Coated woodfree grades, on the other hand, are less price sensitive and more quality and service oriented.

The implication of this analysis is that Canada can be reasonably competitive in any of the segments, but especially the mechanical fibre-based ones. There is some risk in the uncoated woodfree segment based on low cost fibre regions like Brazil.

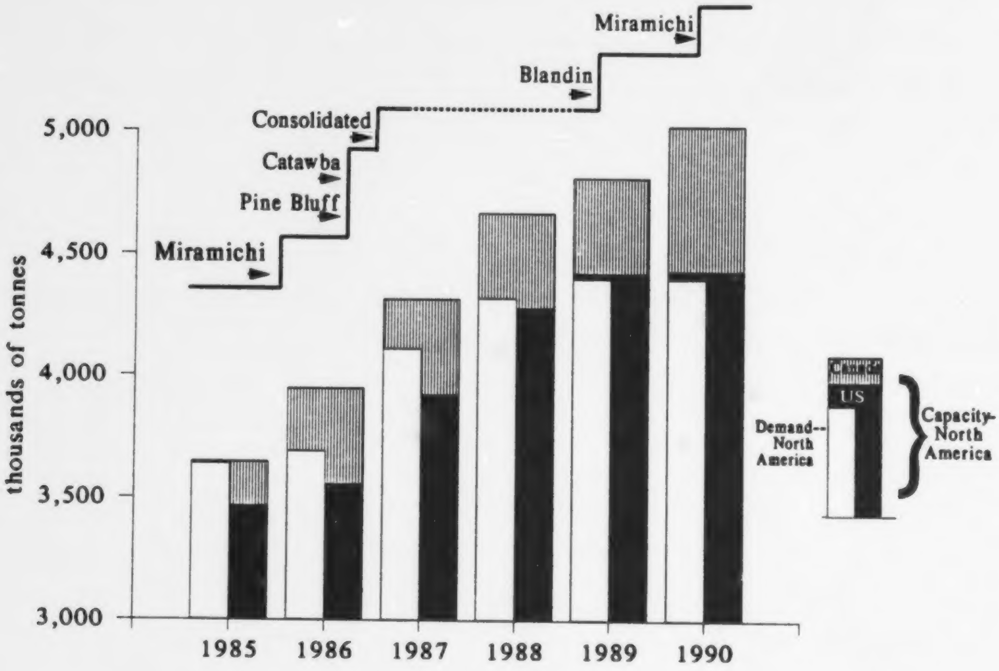
Canada, nevertheless, has a large number of market pulp mills suitable for integration into printing and writing papers. Integration into coated mechanical grades (which use, of course, a mixture of mechanical and chemical pulp) is the most secure alternative but since chemical fibre is only a part of the total fibre requirement, total integration requires the installation of mechanical pulp capacity. In this regard, existing market pulp mills are, and will continue, to supply a strategic rationale for building a presence in uncoated woodfree grades. While this segment may not be the first choice from the perspective of competitive outlook, it may be considered a better alternative for marginally competitive pulp mills than to remain as market pulp suppliers.

Competitive Activity

Building a presence in the upscale printing and writing market will not be an easy undertaking. US and Western European producers have also recognized the need to move to value-added products in favour of commodities. US producers have added a great deal of coated paper capacity over the past decade, and most recently much of that capacity is in the form of large-scale machines. Following in the footsteps of a major round of LWC capacity additions in the early 1980s (Boise-Rumford, St.-Regis-Sartell, Mead-Escanaba, Weyerhaeuser-Columbus), four more new machines were started up almost simultaneously in 1986 (Figure 1-51). North America moved from a capacity balance position in 1985 to a continental surplus in 1987. This oversupply situation resulted in a weakening of LWC prices, which, in turn, caused an increase in demand. The rapidity of the change from oversupply to relative tightness of the LWC market surprised many in the industry. The reverse in the relative value of European and North American currencies also helped the US situation with reduced imports and increased exports. However, this provides a good example of how attractive pricing and adequate supply of universally accepted products can dramatically spur demand.

Already, new capacity is being planned for 1988 and 1989. Canadian producers have been a part of these near-term dynamics, of course, with one new modern machine in Atlantic Canada during the 1986 capacity surge. The same producer is also reporting plans for the next round of increases as well.

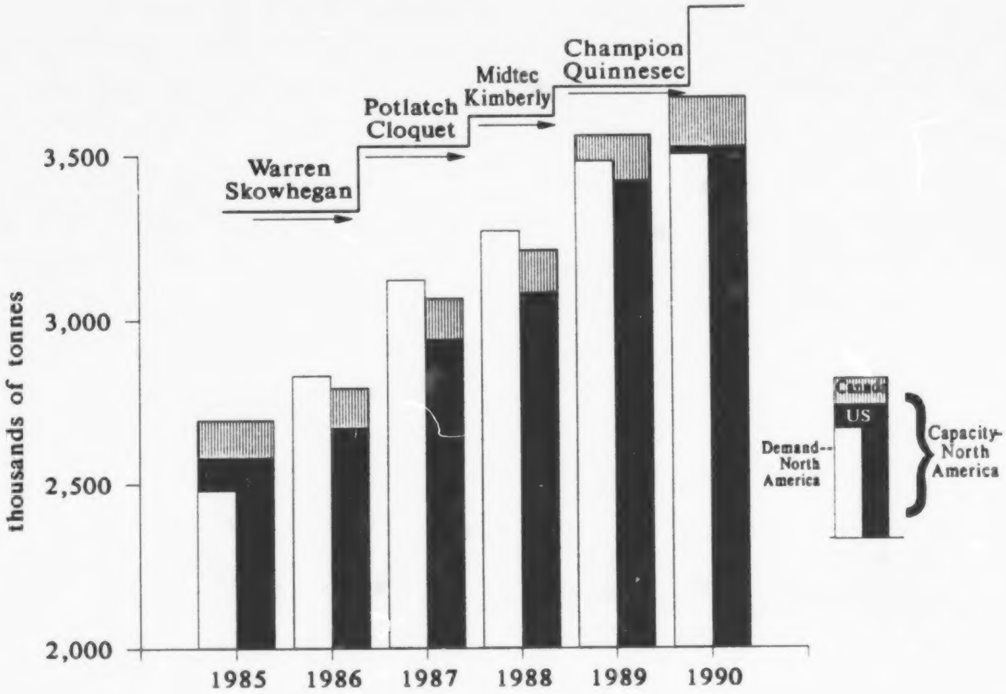
Figure 1-51
North American Supply/Demand Balance and Timing of Major New Paper Machines
Coated Mechanical Papers



Source: RISI, API, WRA Data Base

The coated woodfree segment has also been active but at a more balanced pace (Figure 1-52). The coated woodfree industry in the US did not have a machine over 150,000 tpy until Warren's Hinkley mill (Scott Paper Co.) was built in 1982. While Warren added another major mill in 1986, future increases are expected to be more modest, with large scale machines replacing older, smaller machines. Net capacity increases will therefore be somewhat lower for planned mills like Potlatch-Cloquet and Midtee-Kimberly. The coated woodfree supremacy war continues in the short-term, as Champion recently announced the largest such machine yet at 230,000 tpy, scheduled to start up in 1990.

Figure 1-52
North American Supply/Demand Balance and Timing of Major New Paper Machines Coated Woodfree Papers



Source: RISI, API, WRA Data Base

Many other capacity additions in the coated woodfree segment are less grandiose, however, with machine upgrades and speedups a normal activity.

Success in the North American printing and writing market will not be automatic. US domestic competition is strong and has a considerable lead. Canadian producers can be competitive, however, particularly in the mechanical grades. The high level of value-added activity characteristic of Maine, for example, could be mirrored in New Brunswick and Quebec. Similarly, Ontario has the inherent ability to undertake projects characteristic of the US Midwest (Minnesota, Wisconsin and Michigan).

National Implications

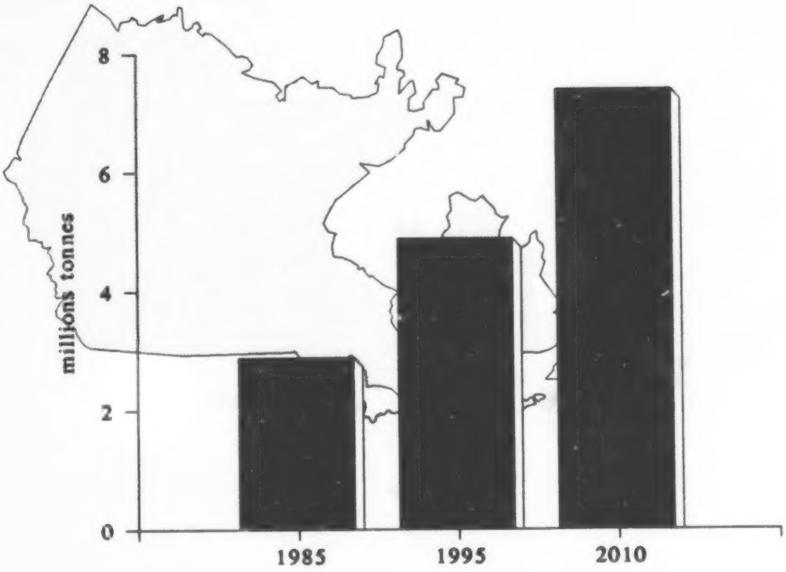
There are a number of factors that come together to make printing and writing papers strategically correct for Canada. They include:

- A large number of nonintegrated BKP mills that provide integration opportunities;
- a large number of smaller scale newsprint machines that must produce higher value-added products in order to survive;
- a number of near-commodity P&W machines that might be converted to even higher valued segments of the P&W group of products;
- a surplus of hardwood species, increasingly in demand for printing and writing grades;
- Canada is relatively more cost competitive in mechanical pulping technologies by virtue of the mix of power and wood costs. As was pointed out, mechanical pulps promise to play an increasing role in P&W papers;
- proximity to the largest market in the world.

How Big is the Opportunity ?

A detailed assessment by region concludes that Canada has the ability to increase its output of P&W paper from the 1985 level of 2.9 million tonnes (this figure includes some uncoated mechanical reported as newsprint but reclassified here as P&W) to roughly 7.4 million tonnes by 2010 (Figure 1-53). The increase will involve the full spectrum of P&W products. It would be achieved by a combination of integration of BKP mills, conversion of newsprint mills and building of new mills.

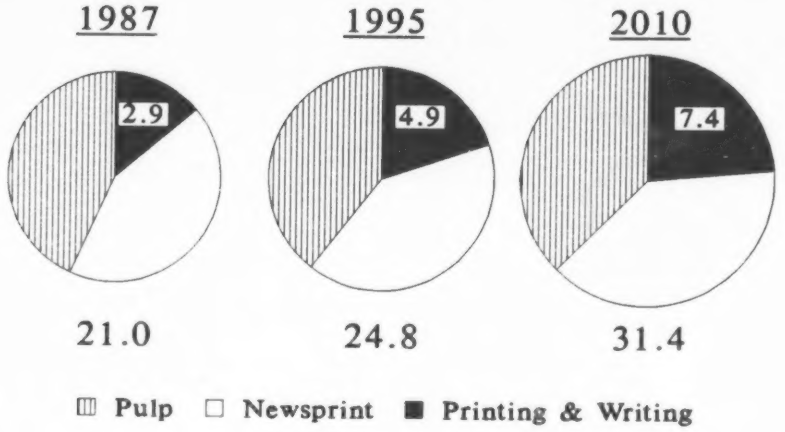
Figure 1-53
Printing & Writing Papers in Canada
Output Scenario - 2010



Source: WRA

P&W papers are expected to be the fastest growing segment in Canada over the next couple of decades. Of the major pulp and paper products produced in Canada (Newsprint, BKP and P&W), the P&W share would increase from its current level of just under 15% to almost 25% by the year 2010 with this scenario (Figure 1-54).

Figure 1-54
Relative Importance of Printing & Writing Papers
In Canada's Output of Major Pulp & Paper Products
(millions of tonnes)



Source: CPPA, Statistics Canada, WRA Estimates

How Will Canada Get This Capacity ?

This segment will grow, to some extent, at the expense of market pulp which will be integrated to produce these papers. There will be limitations on the ability to integrate BKP mills however. One factor is the fibre availability, which is single species softwood, in many locations. A mixture of softwood and hardwood is best suited for most P&W papers. Geographic location of the existing pulp mills will, in many cases, not lend themselves to economical integration. Other site-specific economic factors, as well as company-specific strategic factors, will also be important considerations. A realistic appraisal reveals there is the potential to create as much as one-third of the capacity increase in this scenario from the integration of existing or new market BKP mills in Canada.

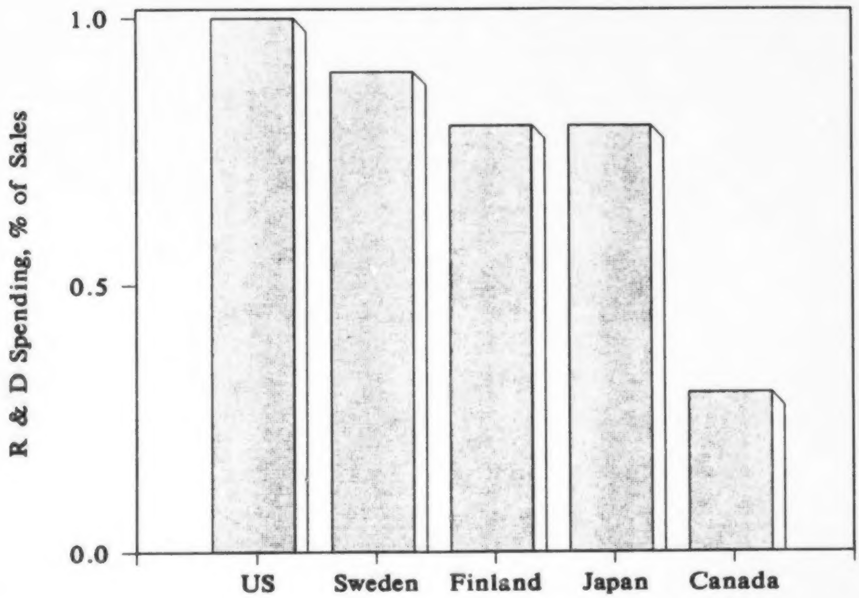
The conversion of newsprint mills to mechanical fibre-based P&W papers also plays an important role in the future scenario for Canada. The analysis of the newsprint sector points out the economic pressures to replace a large part of Canada's newsprint capacity with new mills and/or machines.

Some of the smaller machines could be converted into the fragmented arena of "uncoated", "nearly coated" and "coated" mechanical grades. The dynamic nature of this range of products lends itself to smaller machines catering to specific market niches. As the life cycle for many of the evolving products matures, they too will require large high output machines to remain cost competitive. In the meantime, however, the rate of emergence of new product variations promises to provide fertile ground for companies that wish to pursue niche marketing strategies.

The key to the emergence of this scenario, of course, is the ability and willingness of the Canadian industry to undertake this structural shift. The dynamic nature of the product development process is in sharp contrast to the relatively more static product profile associated with the bulk of Canada's output in market pulp and newsprint.

The development of new products should be related to R&D spending. In this regard Canada has, in the past, seriously lagged behind other developed producing nations (Figure 1-55).

Figure 1-55
Pulp & Paper Research and Development Expenditures by Country



Source: Pulp and Paper Canada 87:10 (1986)

The commodity orientation of the product profile in Canada has allowed the industry to survive and prosper with this low level of investment in the past. The more sophisticated P&W products have always required a more intensive R&D effort, and now with the increased pace of technological development, an even greater effort is needed. A very real question is whether Canada can catch up technologically while simultaneously adapting to the new absolute intensity of expenditures required.

The Canadian newsprint industry, however, has not been insulated from the rapid pace of product change. A similar, albeit less sophisticated, process of change has also dominated this industry over the past few years, and producers have learned to adapt.

Regional Development Scenarios

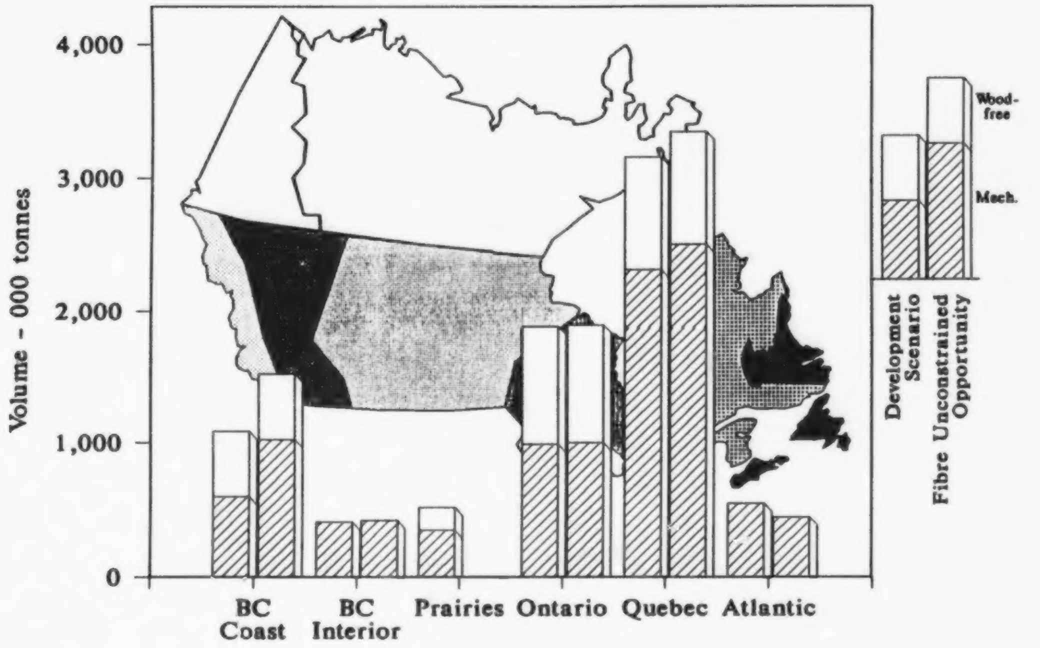
The following outlines a plausible set of development scenarios for each region of Canada. The scenarios represent the combined effect of market demand, fibre supply, future competitive position and the presence of the existing capital asset base.

As with other product groups, the P&W industry sector does not stand alone from other products and the regional implications of those other products. The reality of aging newsprint mills and vulnerable market pulp mills is expected to shape the direction of the P&W industry in a significant way. As with the other product groups, fibre supply and wood species characteristics will have an influence, though less dramatic than some of the others. On balance, the P&W industry should proceed close to its own market-led potential, with some regional shifts.

There is concern, of course, that assumed fibre supply constraints will, in fact, not be real constraints when the actual restructuring is undertaken. The outcome under such a circumstance could be a scenario that is more like the fibre unconstrained scenario outlined on the following pages, or alternatively, a scenario of inaction where structural rigidity inhibits progress.

The following Figure 1-56 depicts the regional shifts in output between a fibre unconstrained situation contrasted with the regional development scenarios presented.

Figure 1-56
Regional Distribution of P&W Papers
Long-Term Effect of Fibre Constraints
(2010)



Source: WRA Estimates

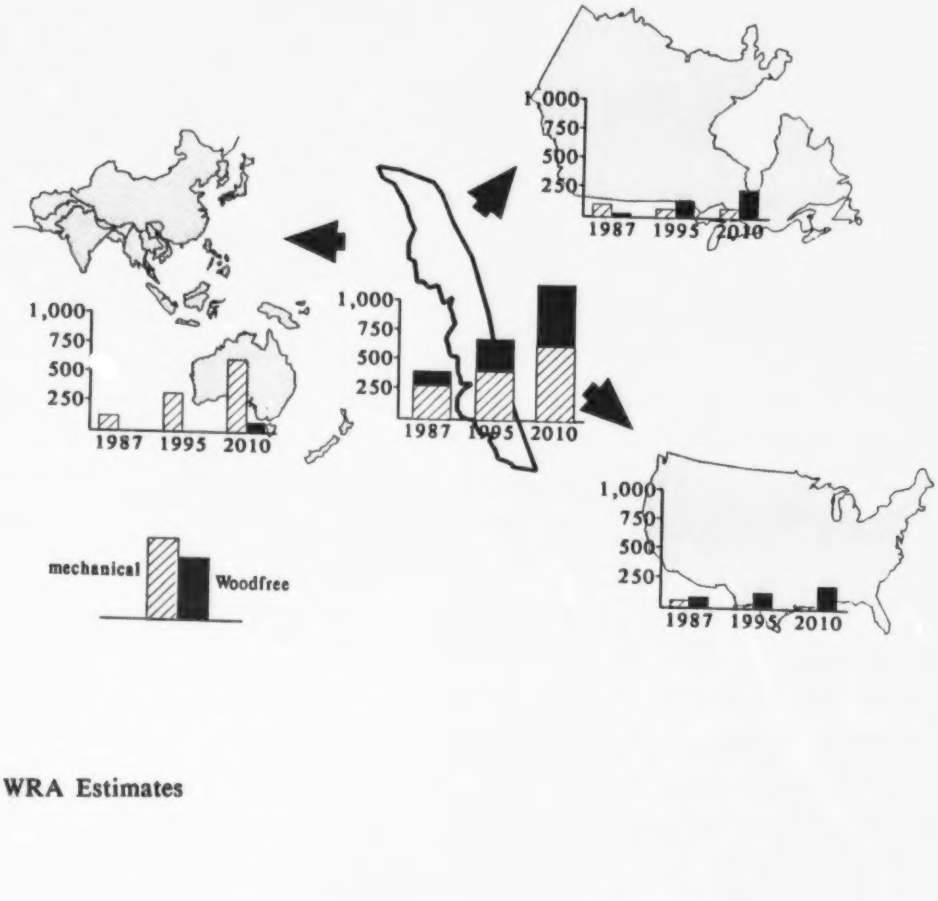
The West experiences some movement of capacity from the BC Coast, cascading through the interior to the Prairies in order to satisfy the market-led demand for these regions. While transportation costs would preferentially place the capacity on the Coast, hardwood fibre restrictions there will encourage the development of the industry further inland.

Development of the industry in the East, however, is shaped directly by the asset base and indirectly by fibre constraints. The shifts in the newsprint industry to move capacity out of Quebec into Ontario is largely fibre driven, but the result of this newsprint shift is the conversion of many older newsprint operations to mechanical-based P&W papers. The conversion to P&W should take place anyway, however, because of the inability of these operations to survive in newsprint in the long-term. The large increase in P&W capacity in Quebec is driven, therefore, to a great extent by the existing capital asset base.

BC Coast

Output in the BC Coast region is expected to increase from just under 400,000 tonnes to more than a million tonnes by 2010. This will be driven largely by new opportunities in the Asia-Pacific markets (Figure 1-57). The market for P&W in the Asia-Pacific region will increase by over 20 million tonnes by 2010. The development scenario assumes that Canadian producers can capture about 4% of the incremental demand. While most of this should originate from the Coast, a portion will also develop further inland (Interior and Prairies).

Figure 1-57
P&W Development Scenario
BC Coast



Source: WRA Estimates

Shipments to the US market are expected to rise significantly, but a shift could occur to more woodfree and less mechanical. This contradiction with the trends almost everywhere else is a result of a combination of factors. Firstly, unsatisfied demand from BC Coast producers for mechanical grades into Asia-Pacific will put pressure to divert more Coast capacity out of the US and into the Asia-Pacific market. At the same time, Interior and Prairies producers are better positioned to serve the US market than the Asia-Pacific markets. Consequently, the inland producing regions will begin to displace Coast producers into the US market. A similar argument holds for shipments into the Canadian market.

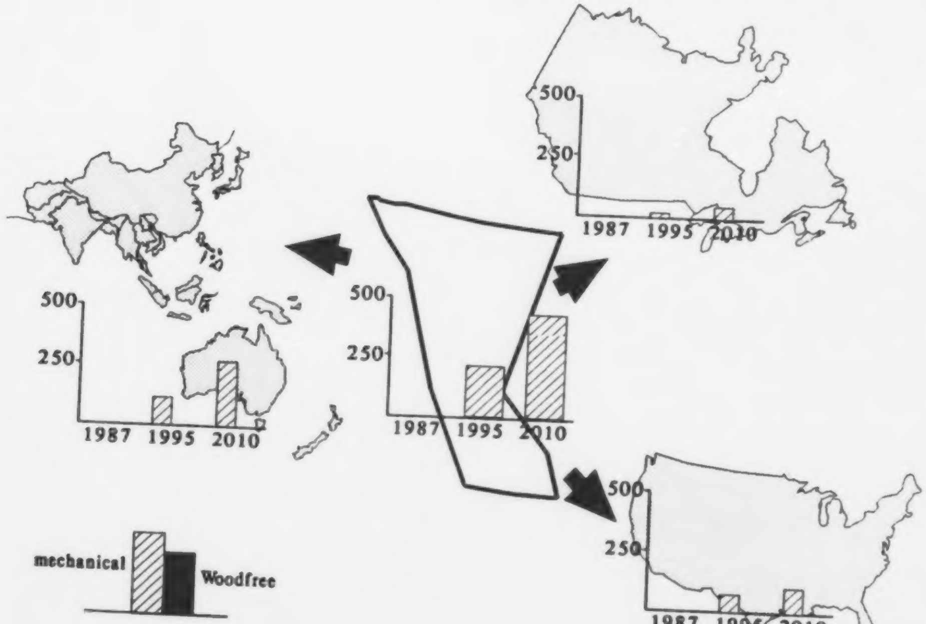
The pressures to integrate pulp mills on the Coast to ensure their long-term viability will produce some woodfree capacity, however, which is more likely to go into the US market rather than the Asia-Pacific market. Japan specifically is a strong producer of woodfree products and this is likely to continue. Consequently, only minor amounts of woodfree grades are likely to make their way into this market.

The BC Coast, like Ontario, will develop its P&W base through a balanced combination of BKP integration and newsprint conversion strategies. The region will become fibre constrained by 2010 and this will have P&W competing for fibre with newsprint. Also, the area must import hardwood BKP from other regions, as needed for some P&W woodfree grades. This will be available from the Interior and Prairies and will limit growth somewhat compared to a fibre unconstrained situation.

BC Interior

The Interior, with no P&W capacity now, is projected to develop about 400,000 tonnes of capacity, the least of any of the regions in Canada (Figure 1-58). Despite the number of pulp mills in this region, no woodfree capacity is expected to develop. This is being driven by the relative absence of hardwood, albeit not as constrained in this regard as the Coast. While some integration is expected, it will likely be into mixed fibre grades with significant mechanical (CTMP) pulps. Installations in this region will need to be highly efficient to offset high transportation costs. This implies a combination of mechanical pulp and BKP mills, fully integrated. A fully integrated softwood/hardwood BKP based P&W mill, however, is not visualized in the development scenario.

Figure 1-58
P&W Development Scenario
BC Interior



Source: WRA Estimates

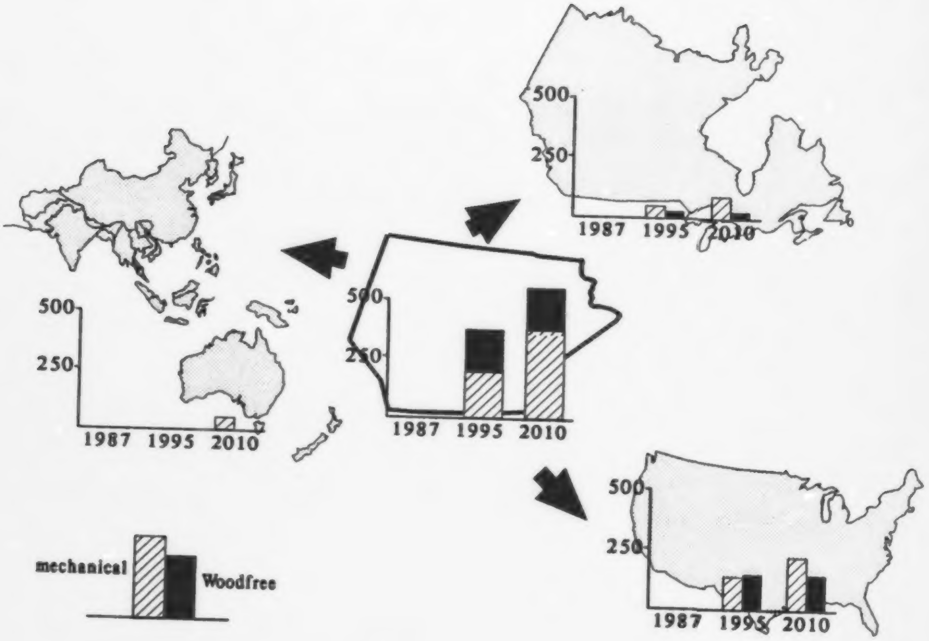
This region will develop more or less in accordance with a fibre unconstrained scenario. The market destination of its products will be affected however. Because of the inability of the Coast to fully satisfy market-led demand from Asia-Pacific, the Interior will pick up some of this shortfall but with a lesser amount into the US market. The US market-led demand, in turn, would be transferred into the Prairies.

Prairies

The Prairies, currently with no capacity in P&W (Weyerhaeuser, Prince Albert start-up scheduled for August, 1988) is expected to grow, but not dramatically (Figure 1-59). First, the region is still developing its industry base and commodity products have dominated in the early development stages in other Canadian regions. Second, P&W papers are more expensive to ship than pulp or newsprint and, therefore, are more sensitive to the transportation disadvantages inherent to this region. For the same reasons, only small quantities of product are expected to go into the Asia-Pacific market. The US market is expected to be the primary destination, in part due to the cascading effect from the BC Coast.

The Prairies have large tracts of low density hardwoods which will tend to feed high productivity mixed furnish mills as noted for parts of the BC Interior.

Figure 1-59
P&W Development Scenario
Prairies



Source: WRA Estimates

Ontario

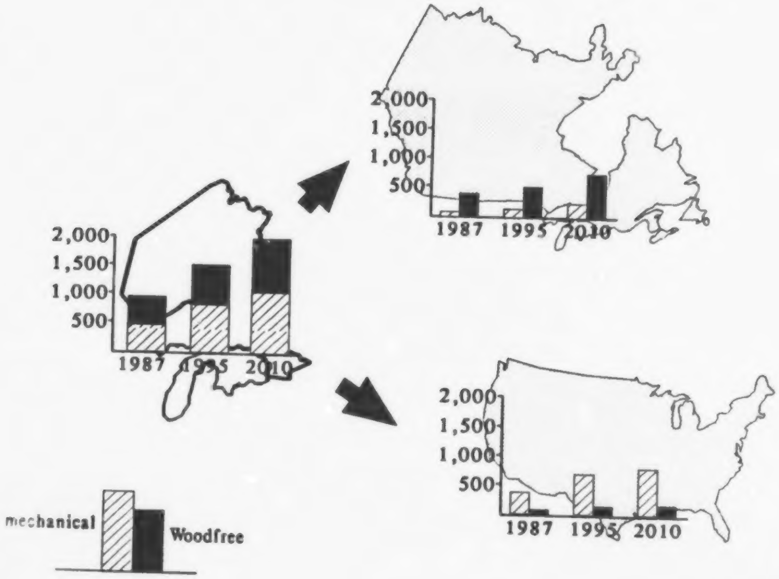
Ontario has a significant presence now in the P&W industry and is balanced between mechanical and woodfree grades. The only coated woodfree producer in Canada is here and there is some quantity of efficient uncoated woodfree production. Overall, however, the industry is still suffering from low efficiency.

Ontario does have the potential to expand and modernize through a combination of conversions, pulp mill integrations and even new greenfield sites. All are built into a development scenario that will double Ontario's output by 2010, while maintaining a balance between woodfree and mechanical. The combination of both softwood and hardwood availability biases the development of Ontario towards woodfree products in spite of the competitive advantages possible in the mechanical grades.

While Ontario is well located to serve domestic markets and exports to the US, it is poorly positioned to serve other markets. Ontario therefore has a relatively balanced split between domestic and export business (Figure 1-60). Ontario has been, and is expected to continue to be, driven as much by its domestic market as the export market.

Another feature of Ontario is the way that mechanical and woodfree grades are devoted to the markets they serve. The domestic market should receive mostly woodfree grades while the US exports will be mostly mechanical grades. This is partially a result of the more dominant mechanical paper capacity base in Quebec which translates into a larger force in the domestic market.

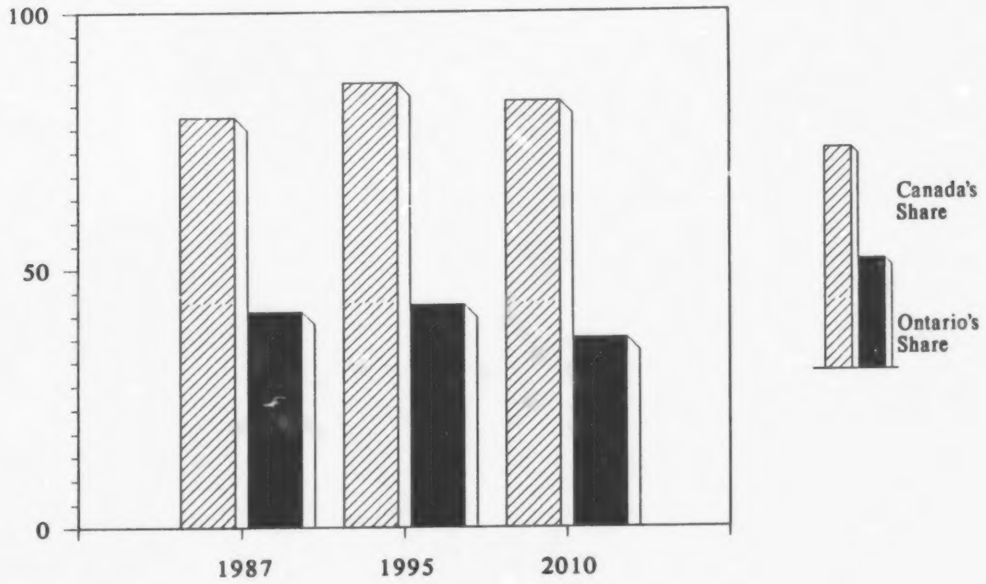
Figure 1-60
P&W Development Scenario
Ontario



Source: WRA Estimates

The development scenario does not contemplate a major shift in this structure of the industry which will be driven by the current capital asset base and should see the conversion of a number of newsprint mills as well as the integration of a number of BKP mills. The growing presence of uncoated woodfree capacity in Canada will tend to maintain or slightly increase Canada's share of its own domestic market, but with Ontario's share of the total domestic market dropping marginally (Figure 1-61).

Figure 1-61
Trends in Supply of Domestic Market for Uncoated Woodfree P&W in Canada



Source: WRA Estimates

Ontario producers have been, and should continue to, rationalize their product mix in more specialized market segments which look increasingly to export markets for long-term viability.

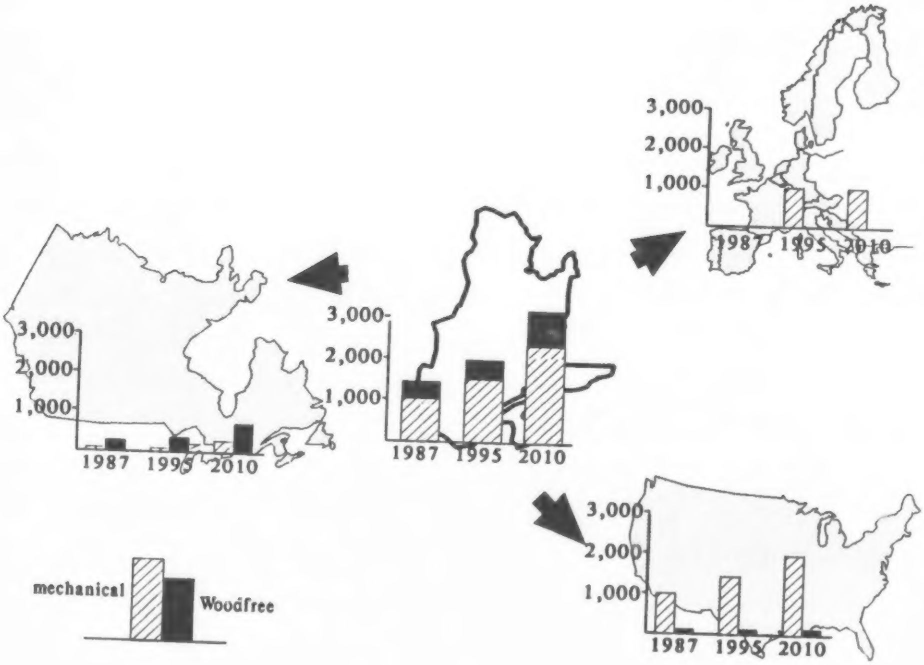
Quebec

Quebec is Canada's largest producing region of P&W at about 1.4 million tonnes. This is somewhat more than the recognized output of just over 800,000 tonnes. Quebec produces considerable quantities of newspaper end-use related product that, for the purposes of this analysis, has been reclassified as uncoated mechanical P&W paper.

While Quebec's share of Canada's total output should decline over time, it will still represent the largest absolute increment. This is being driven primarily by the aging newsprint asset base, which will continue to convert operations to mechanical P&W grades. In the past, a great amount of this conversion has been directed towards products that are positioned in the lower end of the quality and value spectrum. Increasingly, these conversions should be directed towards the higher end of this spectrum (e.g. Abitibi-Kenogami - Alma; Consolidated Bathurst - Grand Mere) in response to market demand which is calling for more upscale products.

The development scenario assumes a very significant structural shift with the conversion of many existing newsprint machines, reducing the newsprint output by upwards of one million tonnes, while increasing the mechanical P&W base by some 1.3 million tonnes (Figure 4-62). The basis for this shift lies in a combination of the newsprint asset base and the fibre resource availability. The fibre resource position is one of overcommitted softwood but with limited hardwood surplus. The newsprint industry, which is based on softwood, can modernize through the replacement of old machines with new ones, but has little or no fibre available for growth. Some of the older newsprint machines, however, could survive making P&W grades whereas they are not likely to survive in most newsprint grades. The established mechanical P&W grades like LWC and SC-A will need to be made on large efficient machines. Many of the new emerging niche products which will fall out of the grade fragmentation process, however, could find an enduring competitive position on these smaller machines. This is not to suggest that all of this capacity shift will be in converted newsprint operations. There will also be cases where old newsprint machines are replaced with new P&W machines. The high volume segments of the P&W industry are moving in the direction of large efficient machines and new capacity in those major segments will need to follow this trend in order to be competitive.

Figure 1-62
P&W Development Scenario
Quebec



Source: WRA Estimates

From a fibre point of view, the hardwood availability allows overall growth without using additional softwood. With the fibre constraints at hand, this will bias industry development more in the direction of newsprint conversion to P&W (which uses some degree of hardwood) rather than straight newsprint capacity replacement with new machines.

Capital requirements relative to total capital availability will also influence industry development. Machine conversion is less capital intensive than complete machine replacement. This report points out elsewhere how significantly more capital will be needed in the future to allow the proper development of the industry. Consequently, industry will seek out instances where the most can be achieved with the least capital. This implies a tendency to convert more machines than would otherwise be the case.

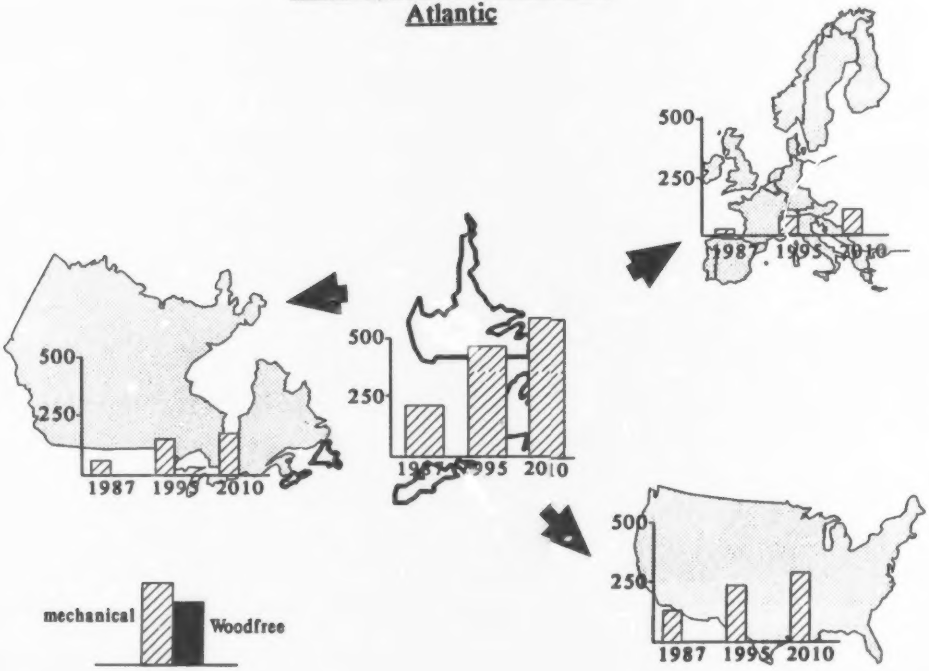
No significant shifts in market destination of product from Quebec are envisaged in the development scenario (Figure 1-62). The US market should remain dominant, especially for mechanical grades. A modest entry into the Western European market is included in the scenario, despite the relative self-sufficiency of this market area. Mechanical P&W grades should be readily acceptable in the European market, however, and the large P&W industry that should emerge in Canada is likely to find at least a limited market there.

Atlantic

While continued growth is expected in Atlantic Canada, there are no dramatic structural shifts contemplated. The current distribution of product includes Western Europe in a modest way with the rest to the US and the domestic Canadian market. The growth into the Western European market is expected to be significant but still modest in terms of absolute increases. (Figure 1-63).

The addition of a second LWC machine at Miramichi has been announced, to start up in 1990. We can also anticipate modest conversion of newsprint machines in the longer term. All of the incremental capacity is expected to be in mechanical grades. While the integration of a pulp mill or two into woodfree grades cannot be ruled out for site-specific reasons, this has not been included in the development scenario.

Figure 1-63
P&W Development Scenario
Atlantic



Source: WRA Estimates

2

CONTAINERBOARD AND KRAFT PACKAGING PAPERS

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Opportunity Overview

A superficial analysis might incorrectly conclude that Canadian producers of containerboard and kraft packaging papers face a dismal future. Demand growth for commodity linerboard is slow, at best, while world sack kraft consumption is declining steadily. Canada enjoys no particular competitive advantage in these low-value products as they are sensitive to wood costs.

The industry in Canada, however, has survived through some specialization, finding its geographic market niches and vertically integrating into converting operations similar to the US industry. Far from down and out, the industry has the opportunity to be even more selective and opportunistic than it has been in the past.

This will mean specialization rather than growth, and value rather than volume. Some loss in capacity may occur but this should not alter the thrust towards a more specialized industry. The strategy should be defensive in nature, but not one of abandonment.

With most products there are emerging trends that provide opportunities that defy the overall trend. This is usually driven by a marriage of underlying market needs and technological developments. Within the large linerboard industry, one such trend is the rapid emergence of preprinted liner which is driven by the need for a product with improved printing characteristics, and an overall improvement in appearance. A variety of brighter and smoother linerboard segments are emerging at a pace limited only by the imagination of the producing industry.

Similarly, sack kraft is fighting for its place in the rapidly changing world of packaging, by improving the performance of its products. New manufacturing techniques are achieving more strength with less fibre.

The industry response to these changes will involve moderate investment in the conversion or upgrading of existing facilities. New capacity is unlikely in most regions, particularly in view of the expected competition for fibre for use in other highly attractive product alternatives. Exports will be directed primarily at the US market but Asia-Pacific (Japan), and perhaps Western Europe, will also provide some export opportunity as these markets display a higher propensity to develop new and innovative ways to package their products.

About Definitions

In this analysis, we have chosen to group the containerboard and kraft paper products as one industry. This was done because of the strong overlap between these industries: many producers of kraft liner can also produce kraft paper, and vice versa. Therefore any strategic options for producers of kraft liner, for example, will necessarily have implications for kraft paper producers.

Keeping the aforesaid in mind, the "containerboard and kraft packaging papers" industry discussed here can be categorized as follows:

I. **Containerboard**
  1. Linerboard
    a) kraft liner: produced from mostly or all virgin kraft pulp
      i) unbleached
      ii) white top
        - mottled or high quality
      iii) bleached
    b) testliner: produced from recycled furnish

  2. Corrugating Medium
    a) semi-chemical
    b) bogus medium (recycled)

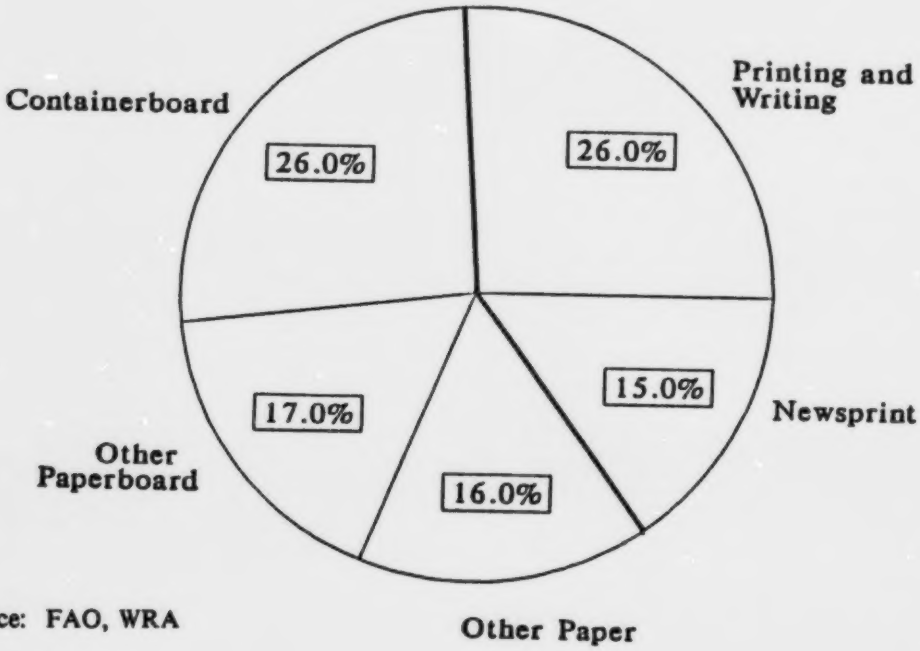
II. **Kraft Paper**
   1. Multiwall (e.g. cement sacks)
   2. Grocery bag and sack
   3. Wrapping
   4. Other

Size and Nature of the Market

The world market for containerboard is approximately three times larger than that of kraft papers. Kraft liner is the primary containerboard product - in 1986, it accounted for over 75% of world trade in containerboard.

The world market for containerboard is large and commodity oriented. In 1985, the industry consumed 51 million tonnes of linerboard and corrugating medium. This matched the size of the global printing and writing paper market and is significantly larger than the newsprint market, as shown below.

Figure 2-1
World Paper & Paperboard Consumption
Product Breakdown 1985
(percent)



Source: FAO, WRA

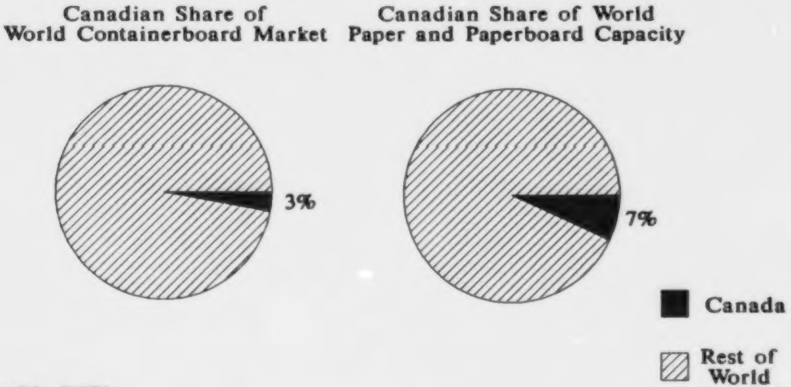
Although world demand for containerboard has been growing at a moderate rate over the past decade, the proportion of kraft liner used in the construction of this product has been decreasing, particularly in Western Europe and Asia. Kraft liner declined from 47% of world containerboard demand in 1973, to 43% in 1985. This is a trend which is expected to continue, especially in Europe, as the use of recycled fibre becomes more widespread.

Approximately 10% of all containerboard produced (both linerboard and corrugating medium) is sold in the world export market. The US and Sweden currently account for 60% of international kraft liner exports, but their market share will shrink in years to come as new nontraditional producers such as Brazil, Chile, Spain and Portugal increase their kraft liner exports. In 1986, total world exports of kraft liner were approximately 5.2 million tonnes.

Canada is perceived as a residual supplier to the world containerboard market. In 1986, Canadian producers held a 6% share of the world market for kraft liner; these exports were directed largely to the US, Western Europe and Asia Pacific. Canadian export activity is also modest in corrugating medium, and of the same magnitude as kraft liner. These exports are primarily to the US and Latin America.

The Canadian containerboard industry has not developed as much as certain other sectors of the forest product industry. As Figure 2-2 illustrates, Canada accounts for 7% of world paper and board capacity, but has only a 3% share of the world containerboard market.

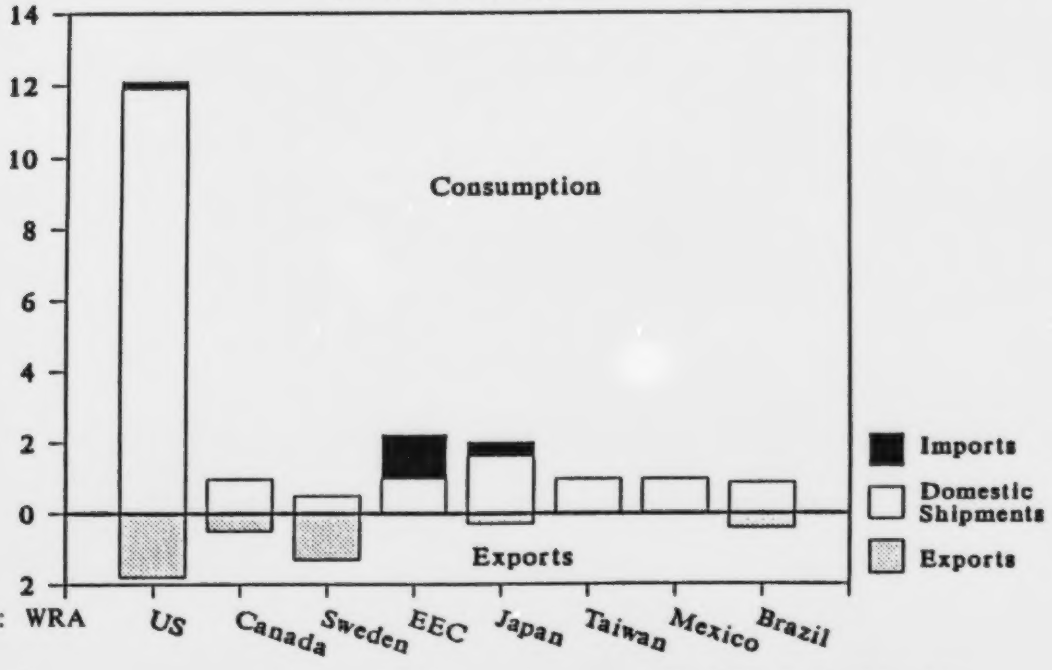
Figure 2-2
1986 Canada's Share of Global Containerboard Market vs Share of Paper and Paperboard Capacity
(percentage)



Source: WRA, API, RISI

Demand for, and production of, kraft liner in the US dwarfs that of any other country in the world, but it imports relatively little volume. The EEC countries and Asia-Pacific are the major importing regions. Figure 2-3 provides a graphic summary of the trade and consumption of kraft liner, for some of the major market regions.

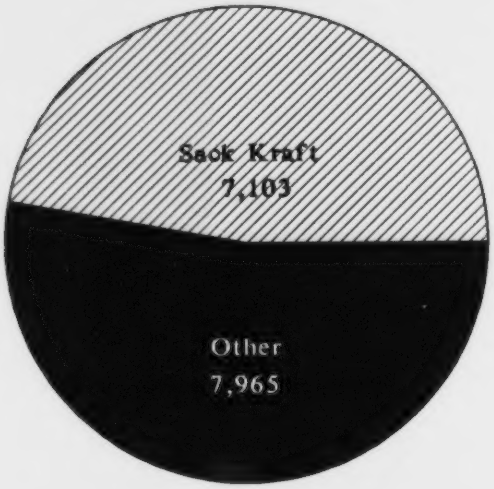
Figure 2-3
World Kraft Liner Consumption and Trade, 1985
(millions of tonnes)



Source: WRA

The nature and size of the market for kraft paper is more difficult to quantify because of its diversity and fragmentation. In 1986, world kraft paper capacity was 15.1 million tonnes, and much of this was concentrated in the more developed regions, such as North America and Western Europe (Figure 2-4). Sack kraft, used in the production of multiwall sacks, accounts for almost one half of total world production, which makes it the single most important grade of kraft paper. Furthermore, a large proportion of this grade is produced for the export market. In 1986, total shipments of market sack kraft amounted to approximately 1.2 million tonnes, excluding US demand.

Figure 2-4
1986 World Capacity for Kraft Paper
(thousands of tonnes)



TOTAL: 15,068

Source: FAO

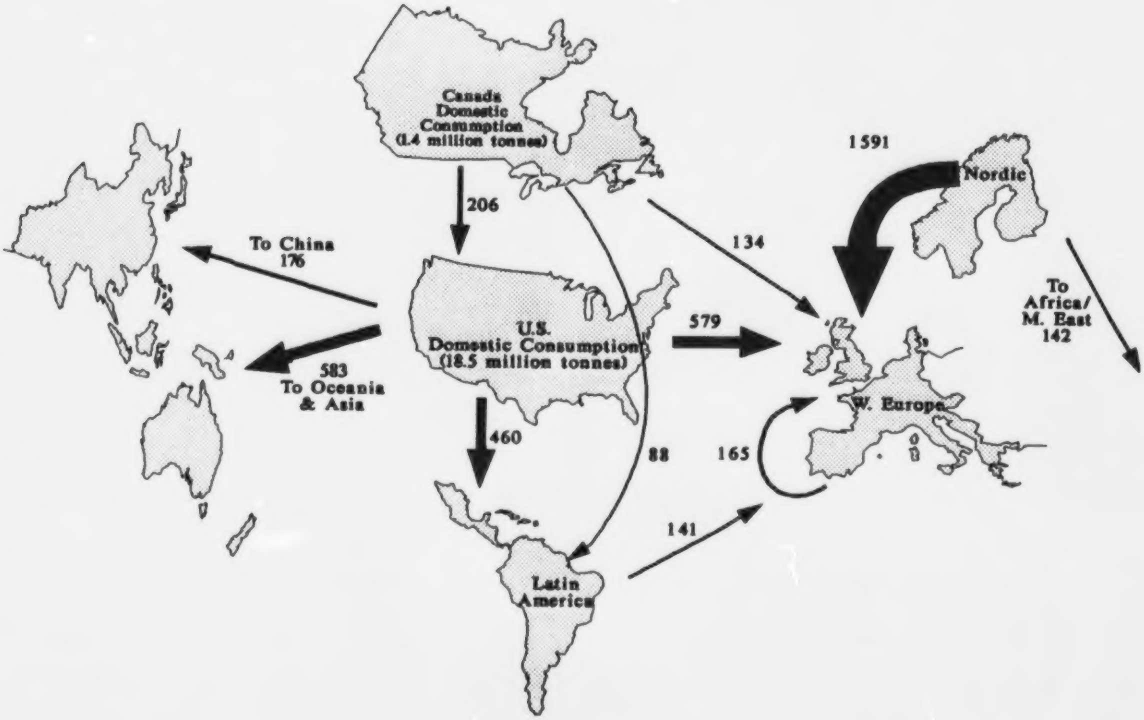
The US is the world's largest consumer of kraft papers, especially sack kraft, and most of this demand is met by integrated facilities. However, little kraft paper is exported from the US. Sweden and Canada are the world's largest market suppliers, accounting for 60% and 15% of the world market respectively.

Canada has a containerboard capacity of approximately two million tonnes, and a total kraft paper capacity of over 550,000 tonnes.

Trade in Containerboard and Kraft Packaging Papers

Containerboard is an internationally traded commodity, with primary trade flows moving from North America and the Nordic countries into Western Europe, Asia and Latin America (Figure 2-5). However, these major trade flow patterns are expected to be radically altered in the years to come. New producing countries such as Brazil, Spain and Portugal do not yet dominate the world export market for kraft liner, but they are expected to represent strong competition to the traditional exporters in the long run. Low fibre costs, in particular, will give Brazil and other nontraditional supplying countries a comparative advantage in the production of a low-yield product such as kraft liner.

Figure 2-5
Containerboard
Major Trade Flows 1986
(thousands of tonnes)


Canada Domestic Consumption (1.4 million tonnes)
206
To China 176
583 To Oceania & Asia
U.S. Domestic Consumption (18.5 million tonnes)
460
88
579
134
1591
Nordic
To Africa/ M. East 142
W. Europe
165
141
Latin America

Source: API

Because of the sheer volume of its wood supply, Brazil presents the greatest threat to the existing market shares of the traditional producers. The Brazilian government recently announced a national objective of doubling pulp and paper capacity by 1995 and, in fact, most existing producers in that country are considering capacity expansions. However, it is debatable whether these increases are attainable in the medium term. Because of its external debt problems, Brazil will have difficulty attracting the capital required to finance these ambitious plans.

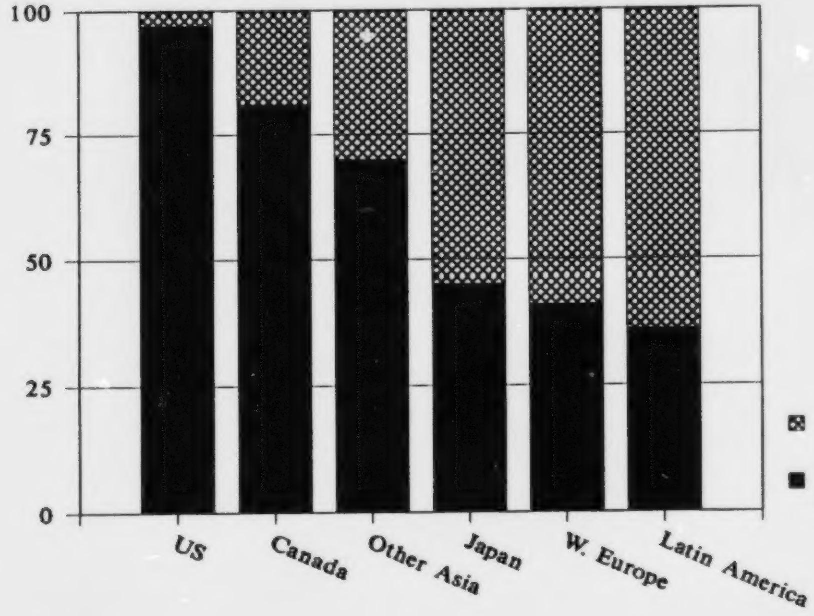
Corrugating medium plays a much smaller role than kraft liner in the world export market. In 1986, total kraft liner exports amounted to 5.2 million tonnes, while corrugating medium exports were 1.4 million tonnes. For the latter product, the Nordic producers and Canada were the largest exporters, holding 40% and 16% respectively of the market. The US and Western Europe are the largest markets for this product.

Trends in Containerboard and Kraft Packaging Papers

The global industry for containerboard and kraft papers, like most other products, is a dynamic one, and it has undergone several changes in recent years. As wood availability and demand growth change in the future, Canada's competitiveness in these products will shift, with profound implications for the future of the industry.

In containerboard, the major trend is toward the increased use of recycled fibre in the furnish. This growing use of recycled fibre is driven by the need to lower costs in the highly price sensitive containerboard market. Old corrugated containers (OCC) provide a source of fibre that has been used by other countries for some time. Japan, Western Europe and Latin America have realized the economic gains from this approach, but Canada and the US have not followed this lead. The use of kraft liner (made with little or no recycled fibre) is highest in the US (97%), while it is lowest in Latin America (36%) (Figure 2-6).

Figure 2-6
1986 Kraft and Testliner as Proportions of Total Linerboard Capacity
1986
(percentage of total)



Source: PPI

The use of recycled fibre significantly reduces the cost of production. Currently in the US, it is estimated that recycled fibre pulp is on average 60-65% cheaper than unbleached softwood kraft. Because furnish is a large component of kraft liner production costs, this translates into considerable savings, and provides a competitive edge.

A major reason that recycled fibre is not used in the US is related to transport regulations. These stringent rules on the strength and weight characteristics of containerboard have inhibited the growth of testliner in the US. The prospect for change to these regulations, and their implications, will be expanded later in the analysis of the US market.

Another major trend in the world containerboard industry is the acceleration of demand growth for specialized grades of linerboard, in particular, white top and lower basis weights. This has come about as a result of the growth in on-shelf advertising and the subsequent requirement for liner exhibiting good printability.

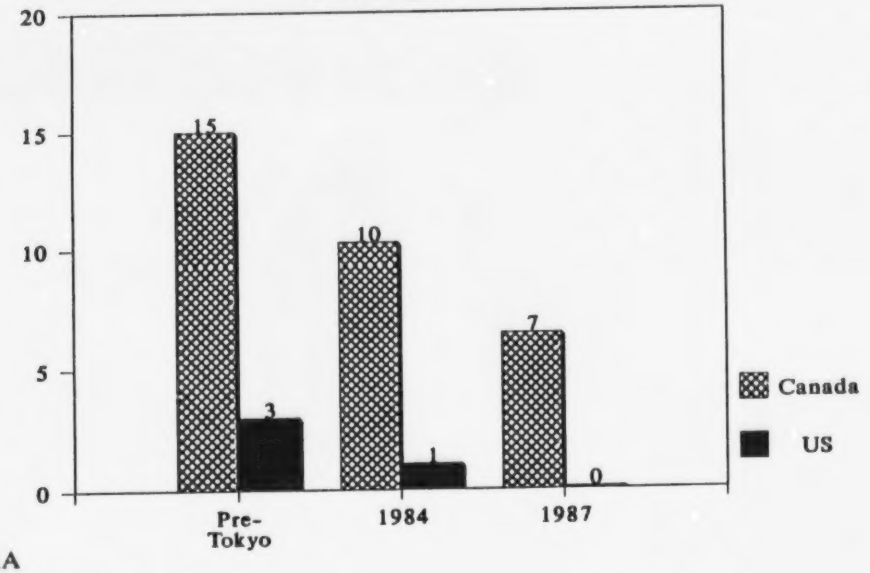
White top liner is a two-ply sheet with bleached fibre comprising the top layer and regular unbleached kraft, with or without recycled fibre, on the back side of the sheet. The bleached top layer is of sufficient thickness to give the sheet a fully bleached appearance from the top. The increasing demand for enhanced printability is driving the rapid growth of this specialized product. One area of significant use is in the construction of small flute corrugated boxes (E-flute, micro-flute), where smaller high quality corrugated containers are replacing folded cartons, historically made from folding boxboard. White top liner is also replacing mottled white liner due to better quality printing, and fully bleached liner due to lower cost.

The growth in demand for these specialty grades of kraft liner has been strongest in Western Europe and North America. This represents a significant strategic opportunity for some existing Canadian producers with access to bleached kraft pulp.

In 1986, US consumption of white top liner was 750,000 tonnes (including mottled). However, there is little production of high quality kraft liner in the US, because most major linerboard mills in that country are integrated to unbleached mills. This will not necessarily be the case in the long-term. Recently, Union Camp announced that it will rebuild one machine in Savannah for the production of bleached kraft liner and, in the future, this type of upgrading is likely to continue. Success in securing a niche in the US market will rely partly on the speed of response by Canadian producers to this short-term imbalance.

Historically, high Canadian tariff barriers have fostered a small-scale industry, oriented towards meeting domestic demand. Canadian import tariffs were 15% prior to the Tokyo round of GATT negotiations and remain at 6.5% today. However, tariffs should not have prevented Canadian producers from capitalizing on the US market. US import tariffs on linerboard have always been low and are now tariff-free (Figure 2-7).

Figure 2-7
US vs. Canada Import Tariffs
Linerboard
(percentage)

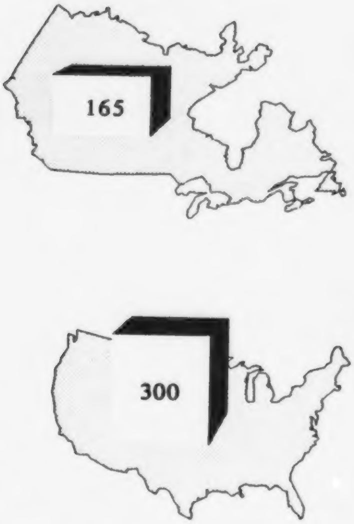


Source: WRA

Despite the low import tariffs on linerboard into the US, the US has remained dominant in its own market for a number of reasons: the initiative taken by the US industry, the vertically integrated structure of this industry, and the relative cost position enjoyed by the US South producers. It is clear that the changing nature of the containerboard market, and the likelihood of a free trade agreement between Canada and the US, will present a challenge to Canadian producers.

The Canadian focus on supplying the domestic containerboard market has resulted in a domestic industry characterized by smaller linerboard machines and, subsequently, higher production costs per unit of output. By way of contrast, many linerboard machines in the US are large and enjoy considerable economies of scale. (Figure 2-8). The inability to be cost competitive is another reason why Canada is a marginal supplier of linerboard to the US market.

Figure 2-8
Linerboard Average Machine Size
Canada vs. US
(thousands of tonnes)

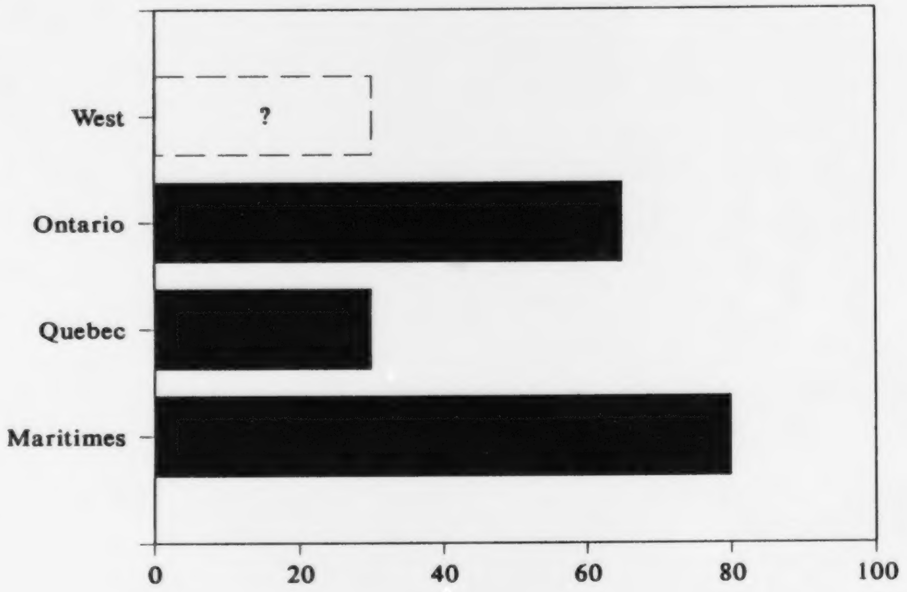


Source: PPI, Lockwood's Directory, WRA

The most dramatic trend in containerboard and kraft packaging papers is the decline in global demand for kraft paper, which began in the mid-1970s and continues today. Substitution by plastic, and new trends in bulk shipping, have had a deleterious impact on the kraft paper industry, with subsequent reductions in world capacity in the past decade. Producers in the US have announced a total capacity reduction of over 450,000 tonnes between 1984-1988. In Canada, approximately 100,000 tonnes of unbleached kraft paper capacity (in Eastern Canada) was withdrawn between 1975 and 1986.

Plastic bags have replaced paper bags in European markets, and are coming into widespread use in North America and Japan. They first emerged in Canadian supermarkets in the 1970s, and have captured a large share of the Canadian bag and sack market since that time (Figure 2-9). In Western Canada, they have just started making major inroads and signal a pending loss of market share to the Western producers of sack kraft.

Figure 2-9
Plastic Bag Market Share in Canada Today
(percent of total bag market)



Source: CPPA

World demand for most grades of kraft paper has been decreasing and will continue to do so in the industrialized nations for two main reasons:

- new shipping trend of distributing previously packaged goods in bulk form (e.g. cement);
- continued replacement by plastics.

The decline in the demand for kraft paper products such as sack and multiwall, plus increasing fibre costs and competition from developing nations, will motivate traditional suppliers into product upgrading and forward integration. Thus, emerging producer countries like Brazil will capture larger shares of the commodity kraft paper market in the years to come.

The future scenario for kraft papers may not appear entirely optimistic to Canadian producers, but it must be observed that there are grades in which demand is increasing, and will continue to do so. Unlike most other kraft grades, the demand for special industrial papers and bleached packaging papers is projected to increase over the short and long term, particularly in North America and Western Europe. The market for these products is a stable one, characterized by relatively high prices with little variability. These high-value products provide a strategic opportunity for existing Canadian kraft paper producers who can anticipate and meet specific customer requirements.

As a producing country with relatively high fibre costs, Canada's future does not lie in increasing its production of commodity grades of containerboard and kraft packaging papers. The strong emergence of nontraditional producing countries means that Canada cannot compete on a cost basis. Instead, the most promising opportunities will be found in specialization and upgrading to higher-value-added products.

Analysis of Markets

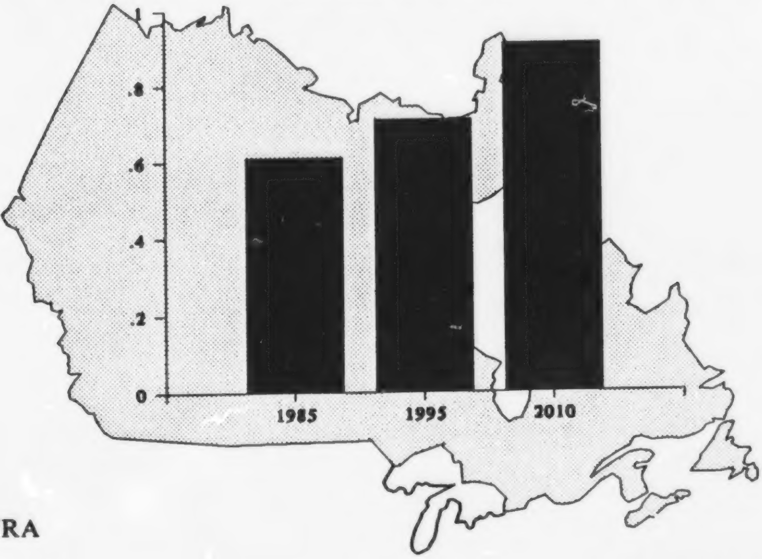
Canada

While Canada consumes a large share of its containerboard and kraft packaging paper output, the growth in domestic demand for many of these products has slowed during the 1980s, and will continue to be modest in the future.

In 1986, 1.9 million tonnes of containerboard were produced in Canada, and 72% of this was consumed domestically. The proportion of containerboard consumed at home has been decreasing - in 1981, domestic consumption accounted for 77%. Thus exports have become more significant to Canadian producers of this commodity.

Kraft liner is Canada's major kraft product, in terms of both production and exports. However, domestic demand growth will not be strong in the intermediate and long term. It is expected to average between 1% and 2% annually to the year 2010, resulting in a net demand increment of 300,000 tonnes (see Figure 2-10). A modest move in the direction of testliner is moderating the Canadian growth outlook for kraft liner, but it does not account entirely for the underlying sluggish pace of overall growth of this commodity.

Figure 2-10
Canadian Consumption of Kraft Liner
Current and Projected
(millions of tonnes)

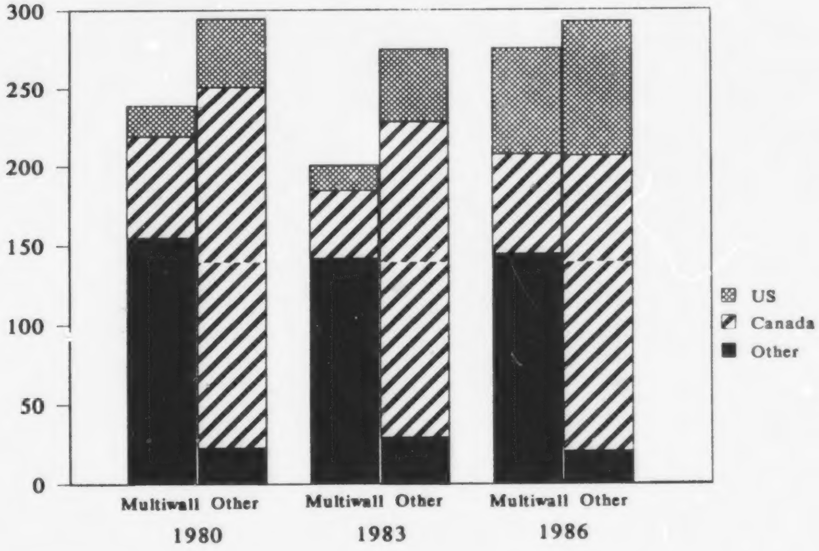


Source: WRA

Canada is largely self-sufficient in containerboard and import requirements are generally satisfied by the US. However, Canada is a net exporter of containerboard to the US. In 1986, for example, Canada imported almost 40,000 tonnes of containerboard (3% of total consumption) from the US, and exported just over 200,000 tonnes to this market. There were no Canadian imports from any other producing region.

In kraft papers, exports as a share of total shipments have remained fairly constant, and are expected to increase slightly in the long term. In 1986, 540,000 tonnes were produced, and 46% of this was consumed domestically.

Figure 2-11
1986 Canadian Shipments of Kraft Paper Products
(thousands of tonnes)



Source: CPPA

Because of the many end uses for this product, it is difficult to quantify the long term Canadian demand for kraft paper products. The substitution of plastics will continue to dominate in the sack kraft market, resulting in an adverse effect on demand. RISI projections show that total Canadian demand for kraft paper will continue to decline at a rate of 1.8% annually to the year 2000. Total capacity is expected to increase from 580,000 tonnes to 640,000 tonnes by 1989 and remain at that level to the mid-1990s; after this, it will decline to 600,000 tonnes and remain at that level to the year 2000. Thus, with an anticipated overall decline in domestic demand and a slight rise in capacity, the export market will become increasingly important in the future for Canadian producers of kraft paper.

In the past, the Canadian paper and paperboard industry has been protected by relatively high import tariffs and kraft liner has been no exception. As was shown previously, the tariff barriers for linerboard have been decreasing in this decade. Certainly the Canada-US free trade agreement will further reduce or eliminate the tariff which currently protects Canadian producers of containerboard from their US competitors. This presents a threat to those Canadian producers who are marginally efficient in the commodity grades.

In the future, the emergence of low-cost kraft liner production onto the world market will erode US producers' market shares. This trend, plus the establishment of free trade in paper and board between Canada and the US, suggests that US producers will step up their commodity linerboard exports into Canada, a market in which they hold a comparative cost advantage. In the long run, Canada will face strong competition in both domestic and export markets for kraft liner.

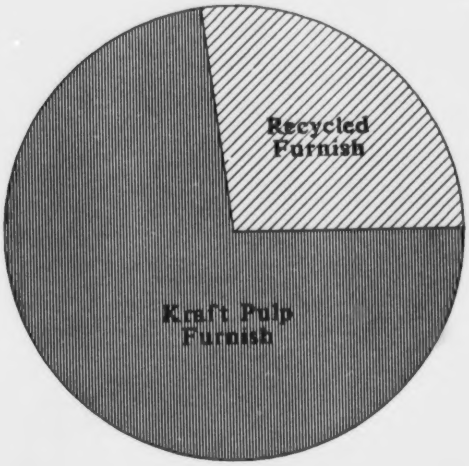
The integrated nature of the Canadian containerboard industry does, and will continue to, work in its favour. Much of the industry is integrated forward into corrugated container production. This extensive integration will continue to support existing containerboard capacity, at least in the medium term. Existing domestic capacity should concentrate on retaining domestic market share through this natural affiliation with converters.

In contrast with the containerboard industry, the kraft paper sector comprises eight mills, which are partly or completely engaged in the production of kraft papers. While all have integrated wood pulping facilities, few of these producers are integrated forward into bag or sack converting.

Any increase in the domestic market share of containerboard lies with either lower costs (in order to remain competitive), or the production of specialized high quality products. The most obvious candidates are white top liner and testliner.

At present, over one-quarter of Canadian linerboard production uses recycled fibre (see Figure 2-12), and most of this testliner is consumed domestically. Canadian wood fibre costs are expected to increase, resulting in the higher use of recycled fibre as a cheaper alternative. The use of testliner in the domestic market is likely to increase accordingly.

Figure 2-12
Share of Kraft and Recycled Fibre in 1986 Canadian Production of Linerboard
(percent of total)



Total: 1.2 million

Source: WRA

Canadian producers who wish to enlarge their domestic market share should also consider the production of white top liner from both kraft and recycled fibre. In North America, the demand for these higher-value grades is growing faster than any others.

The sluggish overall demand growth rate for kraft papers disguises the fact that some sectors are, in fact, flourishing. Although there is little data to quantify it, we believe that the Canadian demand for high-value specialty grades of industrial and bleached packaging is showing the same growth as in the US and is expected to continue in the future. For the kraft paper producers who are willing to upgrade their product and work closely with their clients, this represents a small but lucrative market niche.

In summary, the Canadian market for containerboard and kraft packaging papers is a moderately promising one. Currently, a good deal of the domestic demand for all grades is being met by eastern producers, and this will continue to be the case. While demand growth is expected to be slow overall for containerboard grades, some opportunities exist in the form of testliner and specialized grades of white top. Canadian demand growth in kraft papers is likely to be stagnant in the future, with the exception of specialized grades tailored to the needs of specific consumers.

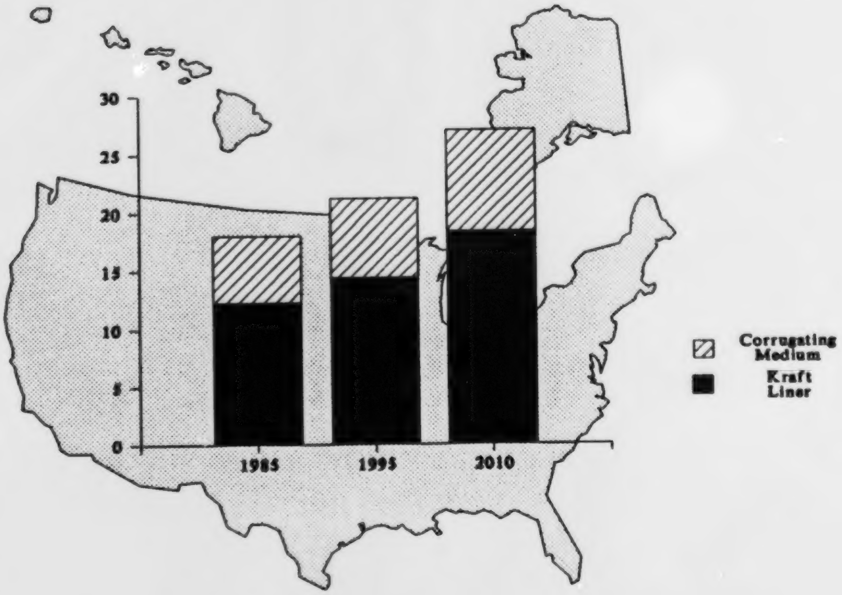
United States

Containerboard

The US is the world's major market for heavy kraft liner, primarily because of the structure of its containerboard industry. The forces of competition from nontraditional producers, and growing domestic demand for high quality bleached kraft liner, will change this industry.

Although the US is the world's largest consumer of containerboard, demand growth for this product has been moderate, and this will continue to be the case. Over the period 1985 to 2010, the demand for kraft linerboard is expected to grow at 1.6% per year, reaching a total of 18.3 million tonnes. This represents an incremental demand of six million tonnes over the next 22 years (Figure 2-13).

Figure 2-13
US Demand for Containerboard
Current and Projected
(millions of tonnes)



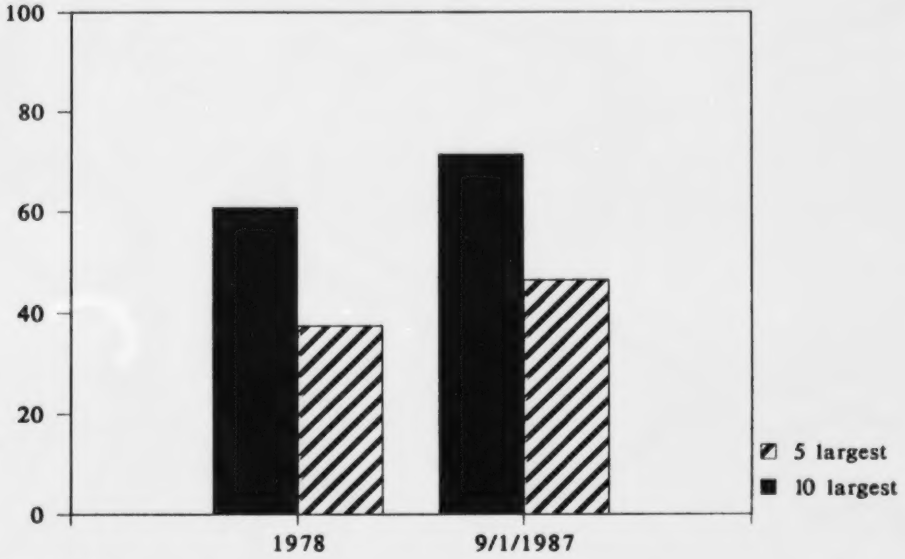
Source: RISI, WRA

The US is the world's biggest producer of kraft liner, and is largely self-sufficient in this product. Although the US is Canada's largest export market for a number of pulp and paper producers, Canada exports relatively little kraft liner to the US and, on occasion, has been a net importer of this product from the US. In 1986, the US consumed 65,000 tonnes (or 21%) of Canada's kraft liner exports, which was considerably smaller than Canada's exports to either the Asian or the European markets.

The competition in the US kraft liner market is, and will continue to be, fierce. As a result it has been a very difficult market to enter. The evidence also suggests that Canada cannot be as cost competitive in commodity grade kraft liner as the US South, which reduces the strategic significance of this product to Canada.

The US market is highly competitive because of the strong degree of vertical integration. The domestic supply base has moved over time towards increased concentration and vertical integration into converting plants, thus strengthening the competitive position of domestic linerboard producers and decreasing the opportunities for Canadian exporters. Figure 2-14 illustrates this trend toward higher industry concentration.

Figure 2-14
US Unbleached Kraft Linerboard
% of Capacity



Source: WRA

Before and immediately after World War II, most of the industry was composed of a series of independent companies with modest vertical integration. The driving force for change after the war was the rise of virgin kraft mills which produced paperboard, not pulp, as an end product. These mills were large and the tremendous boom in economic growth during the post-war period made it possible for these mills to operate at a high level of production. However, normalization of demand in the late 1940s began to hurt mill profitability as linerboard demand started to vary.

Moves toward integration began and stimulated new players such as:

- American and Continental Can;
- Phillips Petroleum, who diversified into packaging;
- Time-Life, who diversified into the paper industry with Eastex.

In the 1960s, vertical integration continued and still more players entered, such as US Plywood and Montgomery Ward, who merged with Container Corporation to form Marcor, only to be acquired by Mobil in 1976.

The late 1960s and early 1970s saw the broadening of antitrust laws and a spate of antitrust suits brought by independents, particularly against the integrated linerboard-corrugated medium producers. During the latter part of the 1970s and to the present, corporate raiders have accelerated change in rationalization moves.

The factors which have caused industry concentration are still alive and well, and we must conclude that the move to more concentration will continue. Elements which are giving rise to increasing concentration are:

- recognition by US companies that the optimum corporate competitive economic unit size is inexorably increasing;
- the change in the legal interpretation of antitrust laws in the late 1970s and early 1980s;
- the rise of the hostile takeover and the modern corporate raider;
- good business conditions which have not interfered with "creative" financing.

A very interesting situation in integration recently developed in the US. Great Southern, a division of Great Northern Neekosa, had for a number of years touted itself as a nonintegrated linerboard supplier. During the 1982 recession, the integrated linerboard mills began offering their marginal tonnes to the independents at very favourable prices. Great Northern found its volume severely eroding and its prices for linerboard driven to the lowest level. After this costly lesson, Great Northern began to integrate with the better available independents - a move that is still continuing. While this does not eliminate the independent corrugated box plants, it represents a further reduction. It is doubtful that another linerboard mill will try to capitalize on serving independents.

The main implication of the preceding analysis is that Canadian kraft liner producers have little opportunity in commodity grades of unbleached kraft liner in the US market. However, the US is perceived as Canada's largest market opportunity in a number of specialty grades of containerboard. In recent years, there has been a trend in US demand towards lower basis weights, more white top liner (particularly high quality white top) and more recycled fibre as a means of cost cutting. The increased use of "point of purchase" display of merchandise is creating rapid growth in new linerboard grades that provide improved printing characteristics. The growth in US demand for mottled and bleached linerboard is at least double the overall growth rate for all linerboard.

In 1986, 15% of Western Europe's kraft liner consumption was whitetop linerboard (including mottled liner), and growth had been a rapid 11% per year. If the same relative proportion existed in the US, then it would be consuming some two million tonnes of bleached liner grades when, in fact, actual consumption in 1986 was approximately 750,000 tonnes. Presently, with the exception of Chesapeake, VA, there is virtually no production of high quality kraft liner in the US because most major US linerboard mills are integrated unbleached mills with no current bleached pulp capacity. Union Camp has announced recently that it will build one machine in Savannah for the production of white top kraft liner.

It is reasonable to expect that the North American consumption of bleached kraft liner will grow to two or three million tonnes within the next 5-8 years, primarily in the US. Using a conservative US demand figure of two million tonnes in 1995, there is an expected demand increment of 1.25 million tonnes. It is believed that Canada could capture 20% of this additional demand, or 250,000 tonnes. However, in the long term it is likely that some US producers will integrate to BKP and capitalize on this growing market. Canadian entry into the US bleached kraft liner market will be most expedient in the near term when little competition is present.

It is likely that future changes in transportation regulations will result in the increased use of testliner in the US. Certain shipping regulations in the US - in particular, Rule 41 - impose stringent qualifications on the strength of containerboard used in shipping. Any changes to Rule 41 will have important consequences for the type of furnish used in the construction of containerboard in the US.

Under Rule 41, boxes used in shipping must satisfy certain criteria for burst strength. Heavier basis weights satisfy the "mullen" burst test; thus, the heavier the weight, the stronger a box and its components are thought to be. However, proponents of modifications to Rule 41 contend that it is a box's stacking strength, rather than burst strength, which is relevant today, because of new shipping techniques. Stacking strength relates much more to rigidity than to mullen burst, and the same or improved rigidity can be achieved at lower basis weights. Furthermore, liner made from recycled furnish can provide the same rigidity as that made from kraft pulp. Thus, producers of linerboard will have an incentive to use less expensive furnish if it provides the same stiffness.

The main outcome of changes to Rule 41 would be the increased use of recycled fibre in the production of linerboard and corrugating medium. For a number of reasons, a recycled mill could adjust better than a kraft liner mill to specifications based on stiffness rather than mullen. With recycled corrugating medium, there are several ways in which edgewise stiffness can be increased. Thus, a criterion of stiffer containerboard in the US industry could result in a drop in fibre furnish quality and cost.

Currently, Rule 41 is still intact in the US, but it is likely that in the long run, tests for rigidity will replace those for burst strength. Therefore, producers of testliner who can attain the same strength characteristics as their competitors in kraft liner will have a distinct cost advantage. This is likely to add to competitive pressures in the US containerboard industry.

Based on the above discussion, it is believed that Canadian producers of linerboard must secure a niche in certain specialty grades of kraft liner, such as white top liner, if they wish to enlarge their US market share. In the medium term, they must capitalize on the anticipated high demand growth for bleached grades of kraft liner. However, over the longer term, Canada is likely to be faced with more competition in the US market as Brazil and other nontraditional producers of kraft liner enter the market.

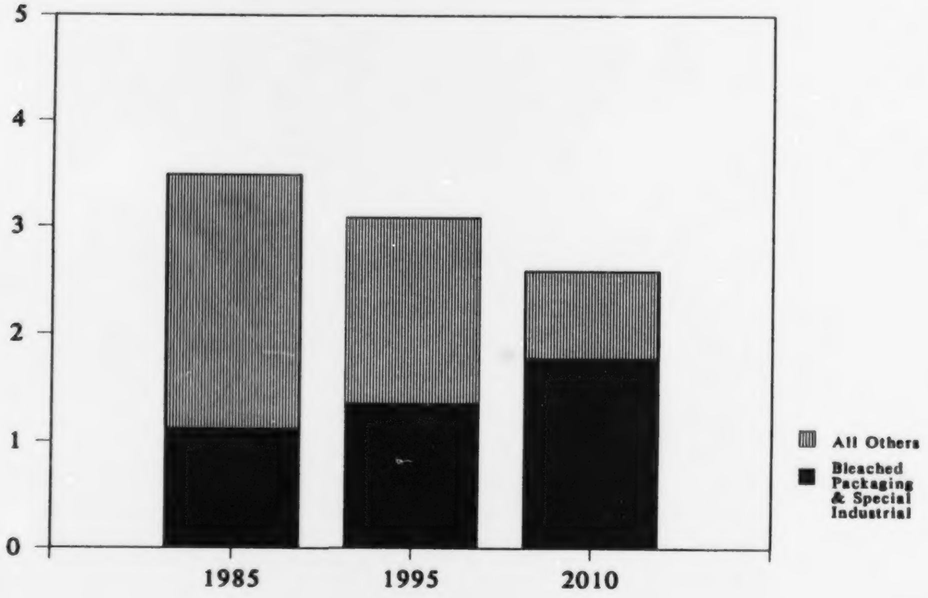
Kraft Paper

Overall US demand for kraft papers in the US is expected to decline between now and the year 2010. As mentioned earlier, this can be attributed largely to new trends in bulk shipping and the substitution of plastics for sack kraft. Some hope lies, however, in certain sub-categories of kraft paper, specifically bleached packaging and special industrial grades.

Specialty papers are usually produced in small volumes, often from unusual fibres or specialty chemicals. Because they are distinctive from large-volume grades, and probably difficult to make, they have limited competition. Some examples of specialty papers are electrical insulating, filter, grease-proof, laminating and top release paper. There are, in fact, hundreds of specialty grades.

As Figure 2-15 illustrates, demand growth will be positive in specialty grades. Between 1985 and 2010, there is an expected demand increment of approximately 65,000 tonnes, or an annual growth rate of 1.9%. Hardly large or dramatic, it does not justify any additional capacity in Canada. However, some existing mills can be upgraded to produce these specialty grades of kraft paper, if they aim to sustain or increase their exports to the US.

Figure 2-15
US Demand for Kraft Paper
Current and Projected
(million of tonnes)

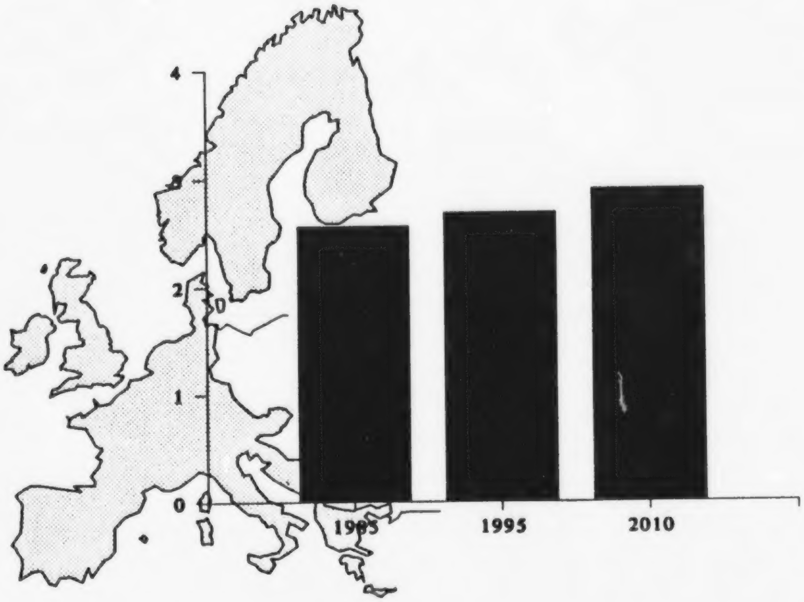


Western Europe

The 1980s have seen considerable changes take place in the Western European corrugated container industry. Liner and corrugating medium made from secondary fibre have been eroding the share of virgin kraft liner and semi-chemical fluting, and this trend will continue. At the same time, strong growth in the demand for higher quality products will continue.

Figure 2-16 illustrates that total European demand for kraft liner is expected to grow at a slow annual rate (.5%) over the period 1985-2010. This is due primarily to the increasing use of testliner as a substitute for kraft liner.

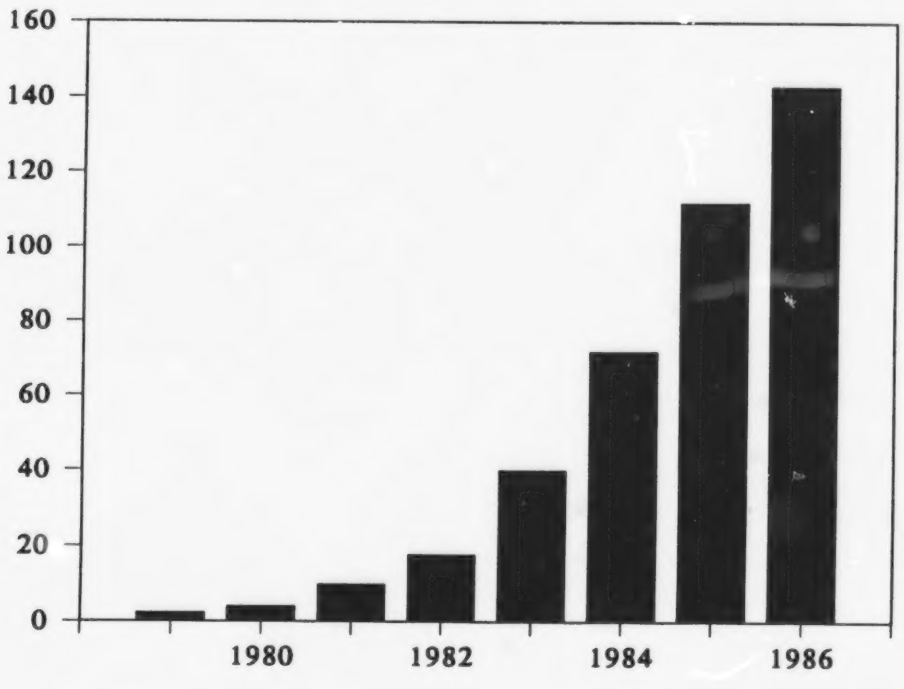
Figure 2-16
European Apparent Consumption of Kraft Liner
Current and Projected
(millions of tonnes)



Source: PPI, WRA

As in the US, however, there is evidence of strong growth in the demand for certain specialty grades. The major change in high quality corrugated boxes is towards preprinted liners with the emphasis on image. This applies particularly in West Germany and the UK (Figure 2-17), with France and Italy following, with a lag of two or three years. The preprinted liner sector in the six major markets of the EEC is still only 3.0% of the total market, but it is growing fast.

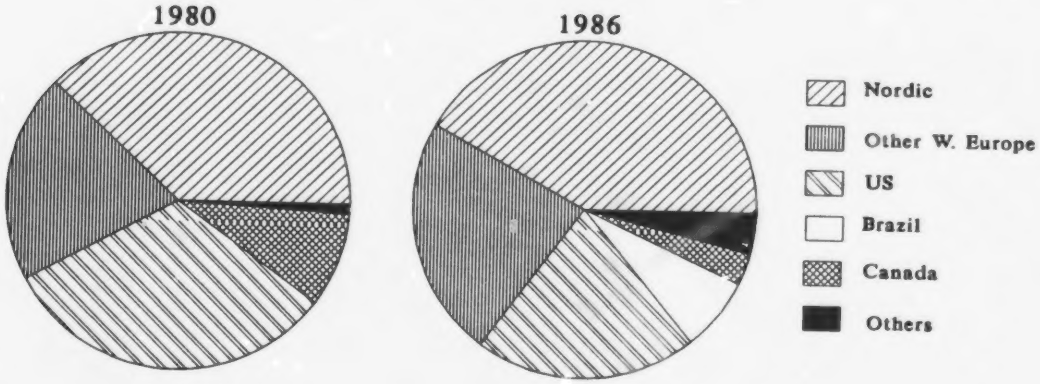
Figure 2-17
The UK Market for Preprinted Liners, 1979-1986
(million square metres)



Source: WRA

With respect to total kraft liner demand, Western Europe has shown a definite move towards greater self-sufficiency in this product. As shown below, Western Europe supplied 58% of its own unbleached kraft liner in 1980, while North America held 41% of the market. In 1986, these market shares shifted to 65% and 24% respectively.

Figure 2-18
Market Shares in W. Europe for Unbleached Kraft Liner
(% of total)



Source: API, WRA

Both the Nordic producers and the emerging low-cost producers of Iberia account for Western Europe's growing domestic supply of containerboard. In addition to these, Brazil is exporting more tonnage into this market, at the expense of the North American suppliers. Western Europe's trend towards higher self-sufficiency is expected to continue as capacity in the Nordic and Iberian countries grows.

For the past five years, the EEC has absorbed approximately one-quarter of Canada's kraft paper exports. Almost all of these exports are sack kraft supplied by western mills. However, demand for kraft paper is slowing dramatically in Europe, as it is in North America, and this has significant implications for Canadian exporters to these markets.

Even producers of specialized kraft papers will have difficulty competing in Europe in the years to come. Canadian mills are generally older than those of its competitors in Sweden and Finland, where superior production efficiencies have resulted from recent capital improvements. Furthermore, the producers of Western Europe are exceptionally flexible and innovative, and present stiff competition.

Currently, Canadian sack kraft is faring well in European markets because of the favourable exchange rate. However, it is expected that Western Canadian exports to Europe will shrink in the future, as producers shift their capacity to the more lucrative Pacific Rim markets. In the long run, Western Europe will be more self-sufficient in kraft papers, as in linerboard.

The European market is a highly integrated one. It is believed that 35% of Nordic producers of containerboard are fully integrated, while 70% are at least partially integrated. In particular, there is a good deal of Nordic integration into West Germany. This situation has proven beneficial for both the containerboard producers who are assured of a market for their product, and convertors who have a stable supply. The degree of integration will likely increase in the short and long term.

Western European demand for kraft liner is characterized by a great deal of variation in grades. Basis weights range from 100 g to 300 g and growth is fastest in bleached liner grades, both coated and uncoated. (In 1986, bleached grades made up 15% of the kraft liner market.) European producers have been progressive in adopting the technology required for these specialty grades, and are either meeting the demand now or will be in the near future.

In conclusion, the trends of higher self-sufficiency, the increased use of recycled fibre and growing vertical integration in Western Europe imply that Canadian exports of most containerboard and kraft packaging papers to this market will not grow. In commodity grades of unbleached kraft liner, Canada is at a distinct cost disadvantage against producers such as the Brazilians and Iberians. Only as long as the Canadian dollar is weak against the European currencies, will Canadian unbleached kraft liner and sack continue to be competitive in Europe. Much of the demand growth in specialty grades of liner board and paper is likely to be met by innovative European producers.

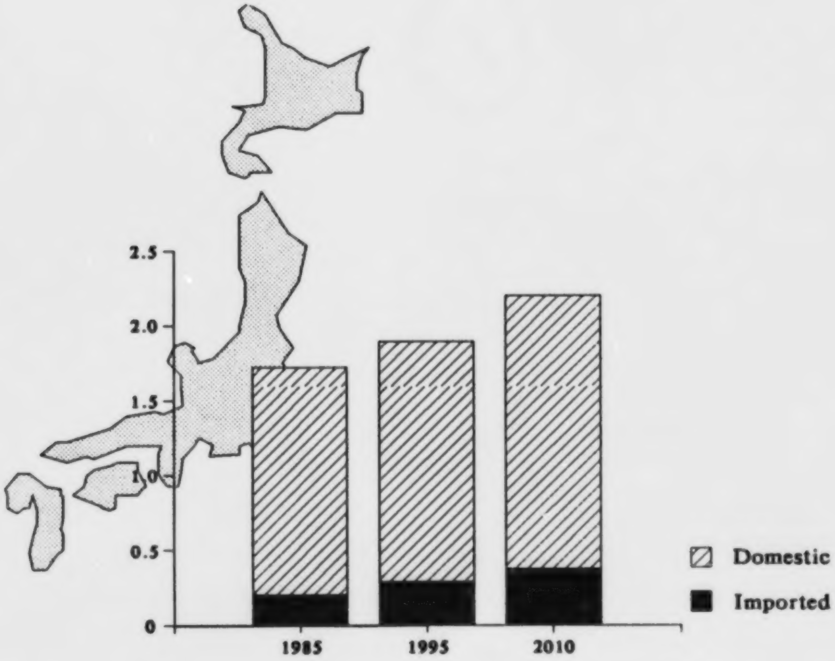
Asia-Pacific

Japan

Japan is forecast to increase its share of imported containerboard and it is perceived as a fairly promising market for Canadian exporters of kraft liner.

Japan accounts for the largest share of kraft liner demand in Southeast Asia. As Figure 2-19 shows, this demand is expected to grow from 1.7 million tonnes in 1985 to 2.2 million tonnes in 2010, which is an incremental increase of 500,000 tonnes.

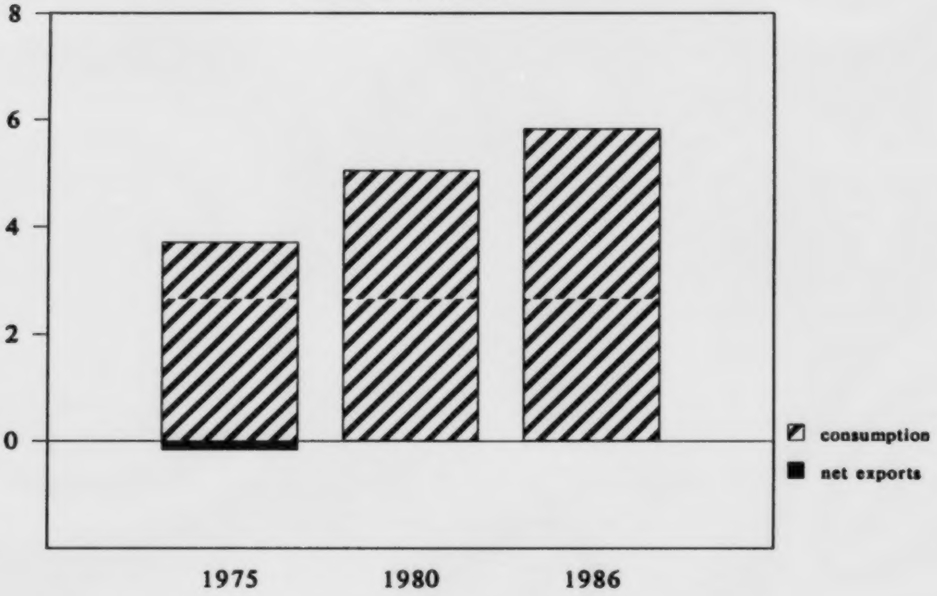
Figure 2-19
Japanese Consumption of Kraft Liner
Current and Projected
(millions of tonnes)



Source: WRA

Japan has the strongest economy of all the Asian nations and growth in this economy fuels the demand for containerboard, although at a slower rate than in the past. As shown in Figure 2-20, the incremental demand of two million tonnes from 1975 to 1985 has been met largely by domestic producers. However, a very strong domestic currency and high fibre costs make imported products attractive. Japan is very likely to start increasing its use of imported kraft liner in the years to come.

Figure 2-20
Containerboard Production and Trade
Japan 1975-1986
(millions of tonnes)



Source: WRA

The use of recycled fibre in Japan has been steadily increasing and Japanese producers now fear that a point of saturation has been reached. While this view is not universally accepted, the implication of reaching saturation is an increased need for imported virgin fibre to enhance the quality of the overall recycled fibre mix. Kraft linerboard is one such product that provides this high quality fibre in the form of a commodity product.

At present, imports and exports balance at around 200,000 tonnes of trade. Most Japanese exports go to China, while imports are almost all from the US and Canada. Japan imports kraft liner (mostly bleached) from North America which helps to keep its recycled quality up.

How much of future Japanese kraft liner demand will be met by imports? RISI predicts that by 2000 approximately 17% of Japan's kraft linerboard requirements will be imported. If this proportion is the same or higher in 2010, Japan's imports of kraft liner will be at least 375,000 tonnes.

US and Canadian market shares in Japan are projected to decline, beginning in the 1990s. This is due primarily to the emergence of low-cost competitors such as Brazil, New Zealand and Indonesia. These regions have low wood costs, which gives them an advantage with fibre-intensive kraft liner. However, North American producers of kraft liner will continue to be the major Japanese suppliers. Although the US market share should decrease to about 60% in 2000, and the Canadian market share to 20%, in absolute terms this still represents an additional 20-30,000 tonnes of Canadian kraft liner exports to Japan between 1986 and 2000.

In order to compete against the new low-cost suppliers in the Japanese market and minimize loss of market share, Canadian producers must cultivate a reputation of consistent high quality with their Japanese buyers. In addition, considerable energy must be put into the development and fostering of long-term relationships and business arrangements. This is a major reason for the success of US exports to Japan. Acceptance in the Japanese linerboard market has taken place through captive agreements, such as the Weyerhaeuser-Rengo agreement.

Other Southeast Asia

Because of growing competition by the nontraditional producers of containerboard and kraft packaging papers, the Asian market is not perceived as a promising opportunity in the long run. Unlike Japan, long-term trade relations are not always established between buyers and sellers in the other Asian countries. North American suppliers of forest products face strong competition in this market from local producers who enjoy tremendous cost advantages. This competition will increase in the years to come.

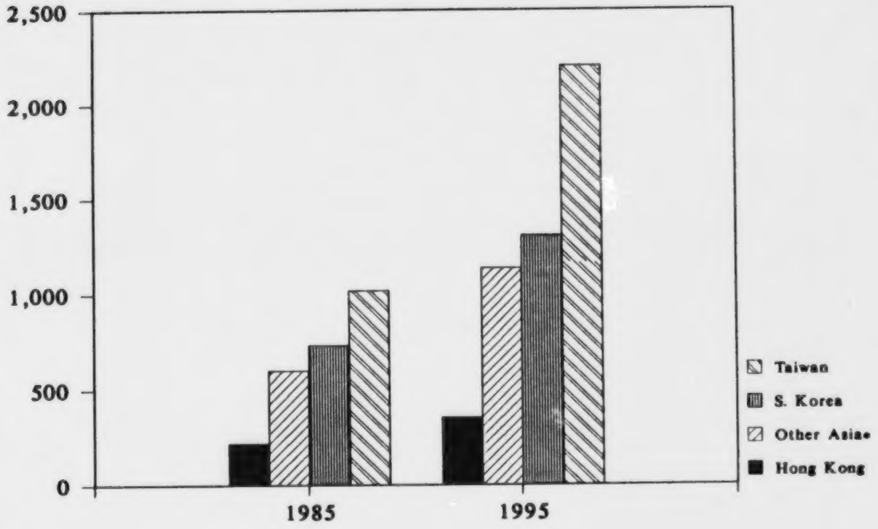
Southeast Asia (excluding Japan) is prospering and has one of the highest economic growth rates of any region in the world. Countries such as Taiwan, South Korea and Hong Kong have increased their exports enormously in the past decade, resulting in substantial current account surpluses.

It is this boom in exports which currently drives the strong growth in Asian containerboard demand. The majority of this region's consumption is for the packaging of exported goods. Continued economic growth is expected to prevail through the 1990s, stimulating further high growth in demand for all grades of containerboard.

Southeast Asian containerboard demand grew over 40% between 1980 and 1985, and a good part of this growth can be attributed to Taiwan's success in world markets. Over the next eight years, containerboard demand in Southeast Asia is expected to almost double, reaching 5.0 million tonnes in 1995. This is a demand increment of 2.4 million tonnes between 1985 and 1995.

Figure 2-21 illustrates that Taiwan, South Korea and Hong Kong are the largest other Asian consumers of containerboard. Their percentage of the total regional market is expected to remain constant at approximately 75%.

Figure 2-21
Other Asian Containerboard Demand
Current and Projected
(thousands of tonnes)



Source: BIS-Shrapnel Pty. Ltd., WRA

Taiwan and Thailand are expected to have the highest demand growth rates to 1995, at 8% and 9% respectively. Taiwan alone will account for an incremental increase of over one million tonnes by 1995. Demand growth in the Philippines and Malaysia will be the lowest at 2.3% and 4% respectively.

Despite these healthy predictions, Canadian exports of commodity kraft linerboard are not likely to meet with great success in the Southeast Asian market in years to come. The Asian market for most paper and board products is a very competitive one, and linerboard is no exception. The low-cost nontraditional producers have made inroads into this market and, as North American fibre costs increase, the former will increase their share of the Asian market. Furthermore, some Southeast Asian countries like Indonesia have become self sufficient in kraft liner, and in the future will increase exports of this product to their Asian neighbours.

Since the beginning of 1984, almost 700,000 tonnes of additional capacity for containerboard started up in Taiwan. Excess capacity and a desire on the part of the Taiwanese mills to satisfy domestic demand has fostered a very competitive market, and there is nothing to suggest this will change in the near future. Thus, Taiwan is not only a limited market opportunity, but represents competition in the remaining markets in this region.

South Korea consumes significantly less containerboard than Taiwan, but remains a major user. Although some imports are permitted, the bulk of domestic demand is supplied by Korean mills. Korea's containerboard industry is presently undergoing extensive rebuilding which should allow it to fulfill its goal of self-sufficiency.

Hong Kong relies heavily on imports of containerboard; the two domestic manufacturers supply less than 12% of the total market. The importers, however, are well established and highly concentrated. It is estimated that Williamette industries control 50% of the linerboard market and that they are becoming increasingly aggressive. In the same way, China is estimated to supply in excess of 70% of fluting. Hong Kong's prices are very competitive, and without close geographical proximity or low freight rates, it is difficult to compete.

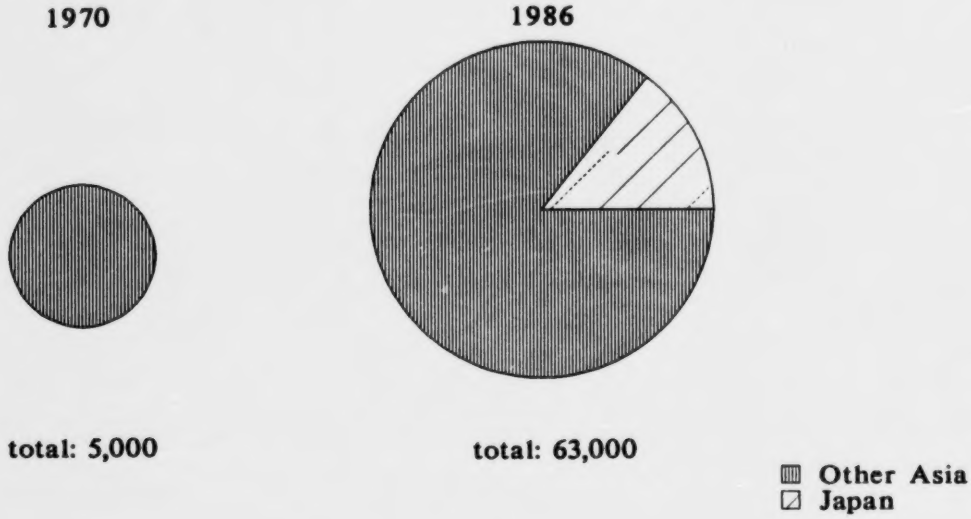
The remaining countries in Southeast Asia consume 600,000 tonnes or 23% of total regional consumption; over 250,000 tonnes of this are imported. These markets are fragmented, highly price-sensitive, and are expected to become less attractive to overseas suppliers.

Limited opportunities exist in this market for outside linerboard and corrugating medium suppliers, as the majority of domestic producers are determined to satisfy domestic demand by increasing production.

The Asian market for kraft papers is small but, like containerboard products, it is diverse. Southeast Asia, including Japan, is one of Canada's smaller export markets for kraft papers. For example, in 1987 Canadian producers of kraft and specialty packaging papers shipped 8% of their exports to Japan and 18% to the rest of Asia, totalling about 80,000 tonnes. Almost all of this was unbleached converting grades such as multi-wall and sack kraft from Western producers.

Canadian kraft paper shipments to the Far East have grown over the past decade, although most of the increase has been to Other Asia (Figure 2-22).

Figure 2-22
Canadian Exports of Unbleached Wrapping Paper to SE Asia
1970 and 1986
(tonnes)



Source: Statistics Canada

Clearly Japan has not been a centre of demand growth for kraft papers and this is not expected to change in the future. Furthermore, although demand growth in the other Southeast Asian countries has been very strong, it is not impressive in absolute terms. This market is an extremely competitive one, marked by exceptional price volatility, especially during recessions. New Zealand and other nontraditional producers have a firm and growing share in the Southeast Asian market, which suggests that Canadian exports to this region will, at best, remain at their current levels.

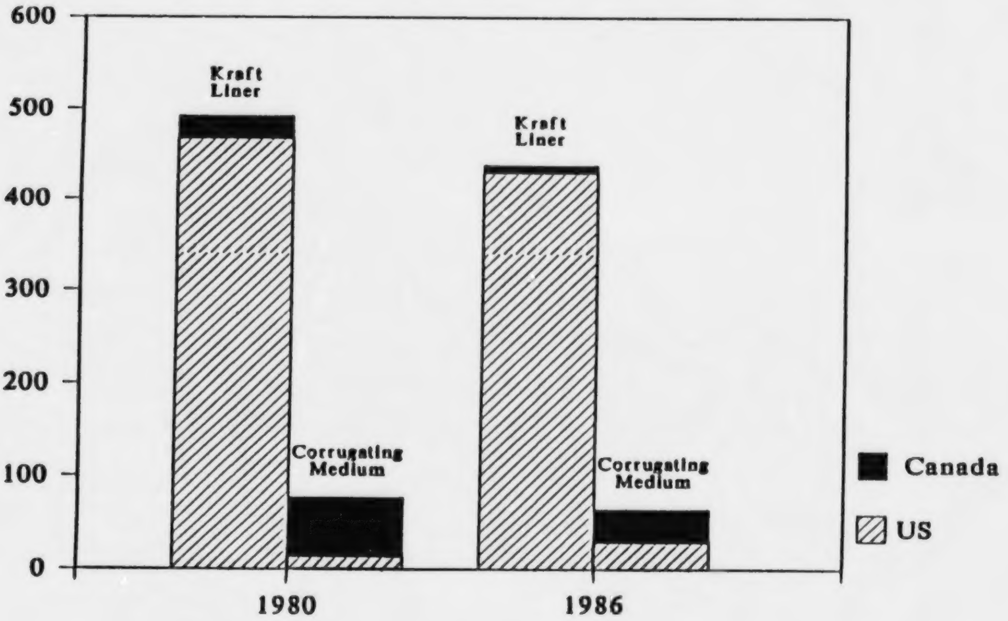
Latin America

Latin America is not perceived as a strategic opportunity for Canadian producers of containerboard and kraft packaging papers. Rather, it poses an unique threat to all the traditional exporters of containerboard and kraft paper.

Historically, Latin America - including South and Central America, and the Caribbean - has imported its containerboard requirements from North America, primarily the US South. However, these quantities are decreasing over time, as South America moves towards self-sufficiency in containerboard.

The US accounts for a major proportion of Latin American kraft liner imports. However, over the 1980 to 1986 period, the tonnage from the US has dropped and this trend is expected to continue. (Figure 2-23).

Figure 2-23
Latin American Containerboard
Imports from North America
(thousands of tonnes)



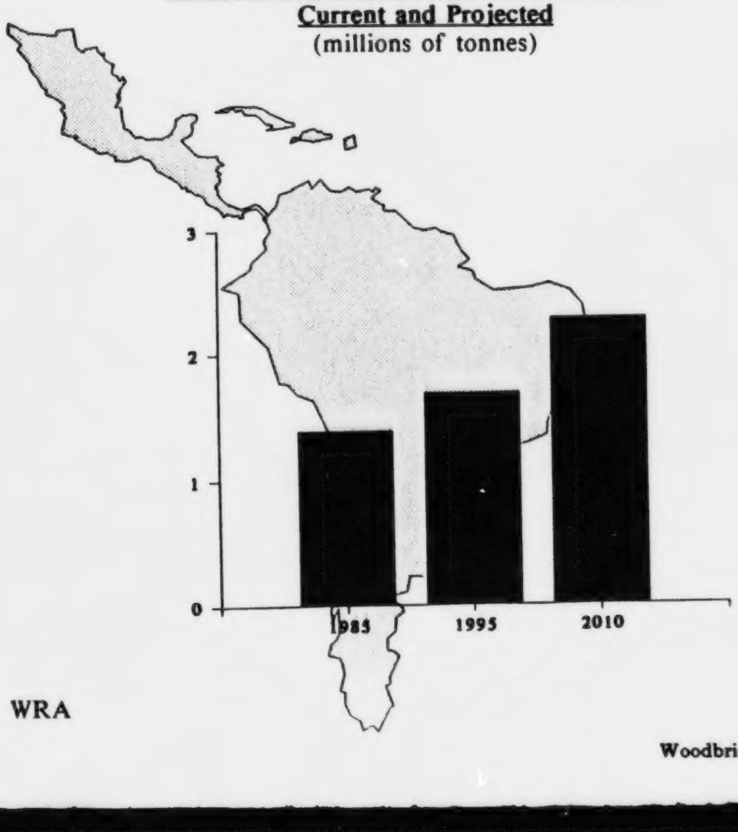
Source: API

Canadian exports of kraft liner to Latin America have declined from 26,000 tonnes in 1980 to an insignificant 8,000 tonnes in 1986. Canada ships more corrugating medium than kraft liner to these regions (70,000 to 80,000 tonnes), but these exports have also declined.

Latin America is an insignificant market for Canadian kraft paper exports - in 1987, it accounted for 4% (or approximately 13,000 tonnes) of Canadian exports and this is likely to decrease.

In 1985, the total Latin American consumption of kraft liner was 1.4 million tonnes (Figure 2-24), and one third of this was imported. Latin American demand for kraft liner is projected to grow at 2% per year until 2010, which implies an incremental increase of 890,000 tonnes. However, much of this is expected to be supplied domestically. Brazil, in particular, is rapidly increasing its capacity in kraft liner and is currently a net exporter of this product. While Brazil supplied very little linerboard to its neighbouring countries in 1980, the total shipments from Brazil to Latin America were 8,000 tonnes in 1986 and this is expected to grow.

Figure 2-24
Latin American Consumption of Kraft Liner
Current and Projected
(millions of tonnes)



Source: WRA

Most of the pulp and paper mills in Brazil are considering major expansions to their existing facilities, although little new capacity will be on stream before 1991. In the longer term, Brazil may produce enough kraft liner to satisfy a larger part of Latin American demand, thereby supplanting some US South competitors in this region. There is also a possibility that Argentina will be self-sufficient in the near future, while Chile has the potential to be so in the long run. (The latter has fibre resources very similar to those in the US South.)

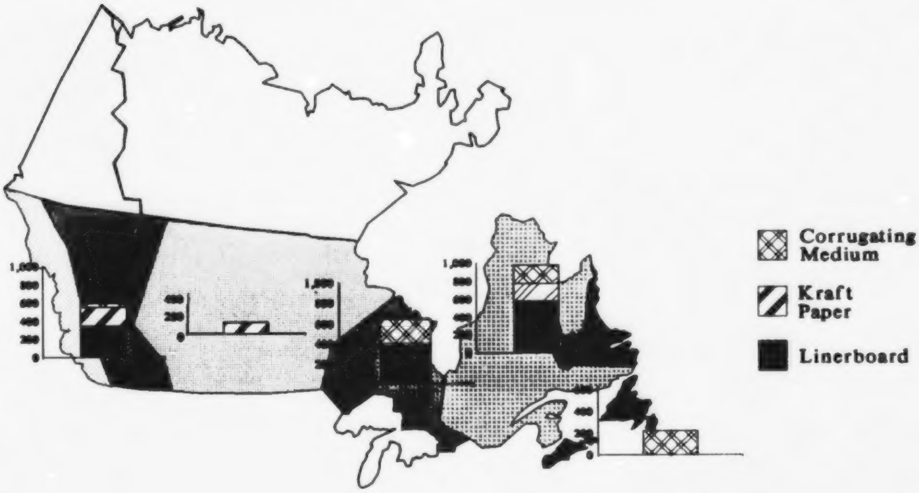
On the whole, very little opportunity exists in Latin America for Canadian exporters of containerboard. Not only will North American exports to this region diminish in the future, but Brazil may become an exporter into North American markets in the long run.

Competitive Position

The Canadian containerboard and kraft packaging paper industry is on the verge of some major changes. The emergence of low-cost producers, growing industry concentration in North America, and a marked slowdown in world demand growth for commodity grade products all contribute to the pressure on Canadian producers to be more competitive or to specialize.

There are 25 mills in Canada which are engaged in the production of containerboard, kraft papers, or both (Figure 2-25), with a total capacity of approximately 2.6 million. Most of the Canadian containerboard industry is integrated forward into corrugated box production. In fact, all the eastern producers are integrated, while the single nonintegrated producer is located in Western Canada. The latter accounts for a large share of total Canadian linerboard exports. Unlike linerboard, very few Canadian producers of kraft paper are integrated forward into the production of bags.

Figure 2-25
Overview of Canadian Containerboard and Kraft Packaging Paper Industry by Region



	BC Coast	BC Interior	Prairies	Ontario	Quebec	Atlantic	Total
Number of mills	3	1	1	8	9	3	25
Capacity	495	100	130	656	963	225	2569

Source: Statistics Canada, CPPA, WRA

A large distinction exists between the kraft paper producers of Western and Eastern Canada. The former are characterized by larger economies of scale, and specialize in the production and export of sack kraft. Producers in the East are numerous, small and fragmented, producing a variety of largely semi-commodity kraft paper grades. They are more oriented to the domestic market.

In today's markets, economies of scale are essential in producing kraft linerboard. Canada, however, does not have a world-class linerboard machine. The largest mills are, on average, 250,000 tpy in size, about 15% smaller than the average US machine size of 300,000 tpy. As mentioned earlier, Canada is a marginal supplier to the world export market, and the domestic market is small. Therefore, large production runs are not feasible; instead, most Canadian mills produce a spectrum of weights for various markets and experience higher per unit production costs as a result.

In addition to poor economies of scale, the Canadian containerboard industry is characterized by older machines, which are at a competitive disadvantage to the large, newer facilities in the US and Nordic countries. A few mills have recently been upgraded, however, and a few more are in the process of doing so.

Both kraft liner and paper are wood-intensive products and Canada does not have a comparative advantage in wood, especially in the eastern provinces. Furthermore, while Canadian mills do have a cost advantage in energy over their international competitors, this is not a major factor in the production of containerboard and kraft packaging papers, which are relatively low yield and use comparatively little energy in production.

Transportation costs are also a critical factor for containerboard and kraft paper. Canadian producers have difficulty competing in the European market against the Nordic suppliers who have a freight cost advantage in this region. However, Western Canadian producers, who have larger economies of scale and lower fibre costs, are marginally more competitive in the European market than their eastern counterparts. In the US market, competition is very strong from the southern producers of unbleached kraft liner who have both fibre and transportation cost advantages over their Canadian counterparts. A further discussion of costs is provided in Chapter VI.

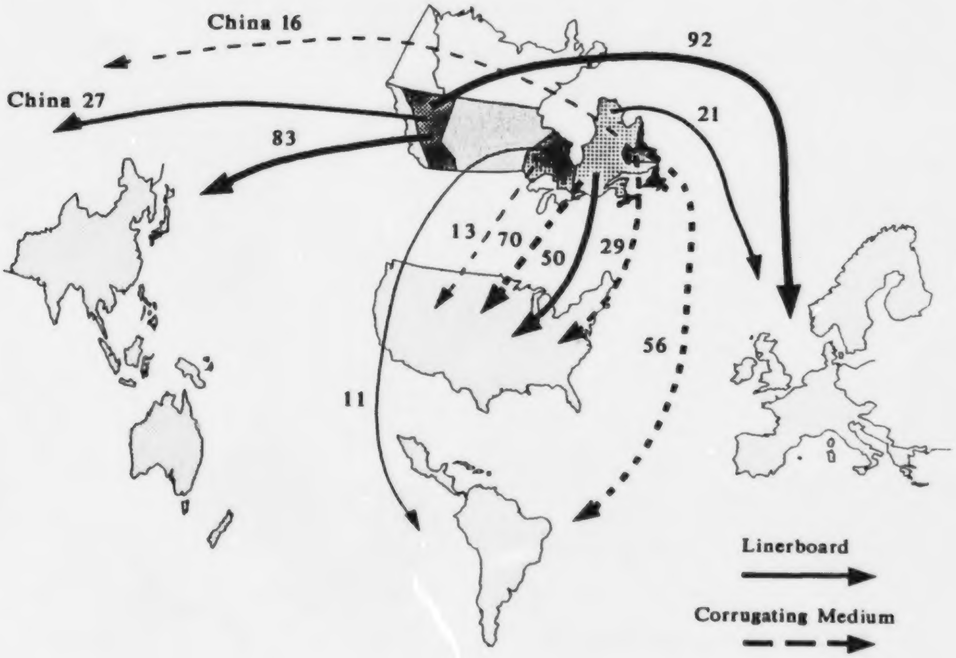
Presently Western Canadian containerboard and kraft packaging papers are competitive in Europe as a result of favourable exchange rates. This market advantage is expected to last only as long as the dollar remains weak against the currencies of the EEC.

Canadian Exports

Canadian producers export marginally more linerboard than corrugating medium. Western Europe is Canada's largest export market for linerboard, followed by the US and Japan (Figure 2-26). The majority of linerboard destined for Western Europe is from BC and Quebec; Quebec is the main exporter of linerboard to the US and BC is the largest shipper to the Asian destinations.

The US is the largest market for Canadian exports of corrugating medium, followed by Latin America and Africa/Middle East. The primary exporters to all these regions are New Brunswick and Quebec.

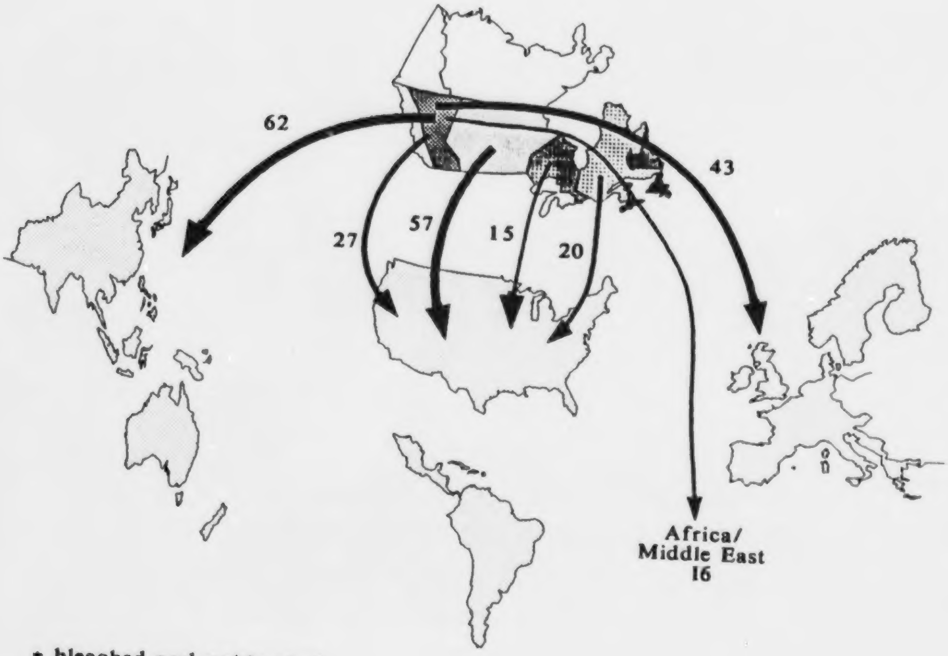
Figure 2-26
1986 Primary Canadian Exports of Containerboard
(thousands of tonnes)



Source: Statistics Canada

Most Canadian exports of kraft paper are unbleached grades. Figure 2-27 illustrates that the largest share of wrapping paper (bleached and unbleached) is destined for the US, while Asia, Western Europe and Africa/Middle East are the next largest markets. The exporting regions are BC, Manitoba and, to a lesser extent, Quebec.

Figure 2-27
1986 Major Canadian Exports of Kraft Wrapping Paper*
(thousands of tonnes)



* bleached and unbleached

Source: Statistics Canada

Canadian Production and Regional Distribution

BC Coast

There are three mills on the West Coast which produce containerboard and kraft packaging papers. These are listed as follows:

Table 2-2
Containerboard and Kraft Packaging Paper Mills - BC Coast
(thousands of tonnes)

Mill Name and Location	Capacity	Grades
Crown Forest Industries, Campbell River	85	Liner/paper
Eurocan Pulp & Paper, Kitimat	320	Liner/paper
Paperboard Industries, Burnaby	90	Liner/med.*

* uses recycled fibre

The three BC Coast mills produce a spectrum of linerboard, medium and kraft papers, both bleached and unbleached. The two mills which utilize virgin fibre produce a variety of kraft paper and liner grades, much of which is exported. Both use softwood as furnish.

Eurocan has recently announced that it is installing a CTMP line to come on stream in 1989, in order to increase its linerboard capacity.

It should be noted here that some of the mill capacities shown throughout this section are estimates. Several mills only report total capacity, without making a distinction between the various grades produced.

BC Interior

There is one mill in the BC Interior which produces containerboard and kraft packaging paper as described in Table 2-3.

Table 2-3
Containerboard and Kraft Packaging Paper Mills - BC Interior
(thousands of tonnes)

Mill Name and Location	Capacity	Grades
Canfor, Prince George	100	Sack

In addition to unbleached sack kraft, Canfor produces bleached and unbleached softwood kraft pulp, largely for export.

Prairies

There is one mill in the Prairie provinces which produces containerboard and kraft packaging paper as described in Table 2-4.

Table 2-4
Containerboard and Kraft Packaging Paper Mills - Prairies
(thousands of tonnes)

Mill Name and Location	Capacity	Grades
Manfor, The Pas	130	Sack

The Manfor mill produces unbleached sack kraft (softwood), primarily for export to the US. Until recently, this mill was for sale and several forest industry firms showed an interest in buying it. There has been a recent change in the provincial government of Manitoba, however, and it is uncertain whether or not this mill will be sold.

Ontario

There are seven mills in Ontario producing containerboard and kraft packaging paper, as described in Table 2-5.

Table 2-5
Containerboard and Kraft Packaging Paper Mills - Ontario
(thousands of tonnes)

Mill Name and Location	Capacity	Grades
Atlantic Packaging, Toronto*	105	Liner/medium
Domtar, Red Rock	220	Liner
Domtar, Mississauga*	96	Liner/medium
Domtar, Trenton*	100	Medium
E.B. Eddy Forest Products, Ottawa	15	Paper
MacMillan Bloedel, Sturgeon Falls*	70	Medium
Paperboard Industries, Trenton*	45	Medium

* includes secondary fibre as part or all of furnish

The Ontario industry is characterized by a large proportion of testliner producers. Secondary fibre is relatively abundant in Ontario (compared to the rest of Canada), although a considerable amount is also imported from the US. The low cost of furnish has made these producers competitive with kraft liner producers in Ontario. Most testliner produced in Ontario and, for that matter Canada, is consumed domestically.

The major producer in Ontario produces unbleached kraft linerboard, using softwood as a furnish. The other small mills produce semi-chemical corrugating medium, and various other board grades.

E.B. Eddy has a small facility and is the only Ontario producer of kraft papers; most of these are for domestic consumption. It also produces a wide variety of fine and specialty papers.

Quebec

There are nine containerboard and kraft packaging plants in Quebec, as described in Table 2-6.

Table 2-6
Containerboard and Kraft Packaging Paper Mills - Quebec
(thousands of tonnes)

Mill Name and Location	Capacity	Grades
Cascades, Kingsey Falls*	30	Liner/medium
Cascades, East Angus	80	Paper
CIP, La Tuque	249	Liner
CIP, Matane*	95	Medium
Consolidated Bathurst, New Richmond	195	Liner
Consolidated Bathurst, Trois Rivieres	115	Paper
Glassine Canada, Quebec City	13	Paper
Kruger, Montreal*	76	Liner
Paper Cascades, Cabano*	90	Medium

* uses secondary fibre as part or all of its furnish

The Quebec containerboard and kraft packaging paper industry is a mix of several small operations and a few large ones. This province accounts for a large share of Canadian exports of corrugating medium and linerboard. In contrast to Ontario, the majority of producers use primarily virgin kraft pulp.

CIP (La Tuque) and Consolidated Bathurst (New Richmond) are both major Canadian producers of softwood kraft liner. Because it is integrated with BKP, the former also produces SBS, bleached and unbleached specialty papers, while the latter produces all unbleached products.

Quebec's other mills produce a spectrum of linerboard, corrugating medium, and specialty papers such as wrapping, extensible, glassine and other converting grades.

In general, kraft paper producers in Quebec produce mainly for the domestic market. East Angus is the exception, exporting almost half of its output in 1986 and 1987.

Atlantic

There are three containerboard and kraft packaging paper mills in the Atlantic provinces, as described in Table 2-7.

Table 2-7
Containerboard and Kraft Packaging Paper Mills - Atlantic
(thousands of tonnes)

Mill Name and Location	Capacity	Grades
Consolidated Bathurst, Bathurst*	150	Medium
Lake Utopia, St. George*	100	Medium
Minas Basin Pulp & Power, Hantsport*	20	Medium

* uses secondary fibre as part or all of its furnish

The Bathurst and St. George mills both produce corrugating medium; the former also produces CTMP market pulp. Minas Basin produces a variety of paperboards in addition to corrugating medium.

New Brunswick is Canada's largest exporter of corrugating medium, with the US and Latin America as its largest markets.

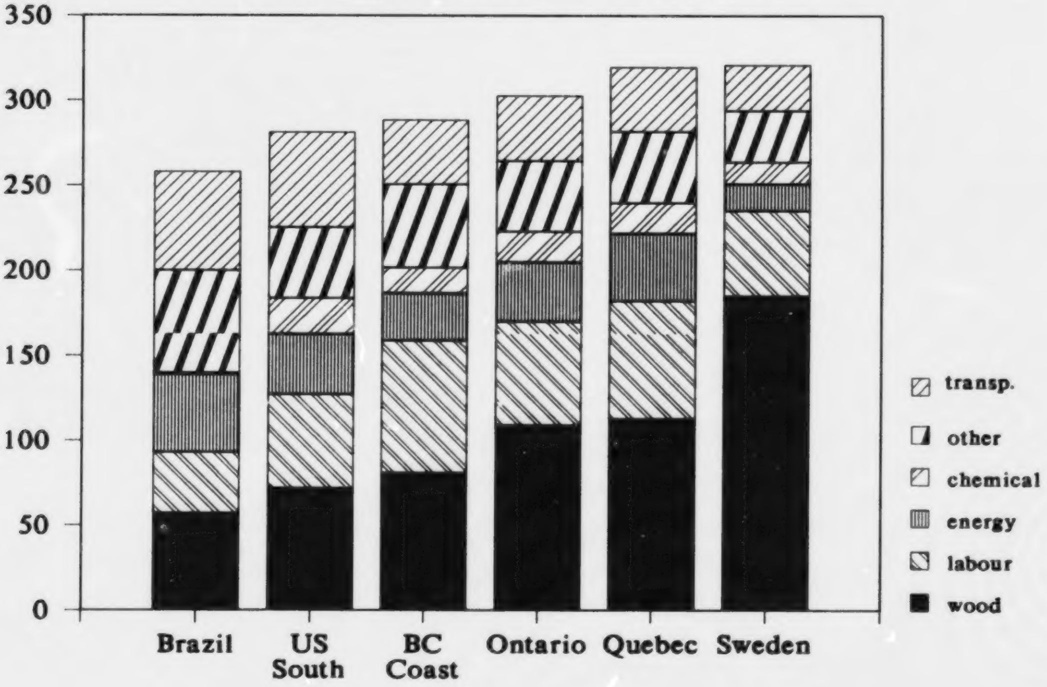
Cost Competitive Position

At present, Canada is in a moderately favourable cost position vis-a-vis its competitors in the world linerboard market. While Canadian production costs are generally lower than those of Scandinavian or Japanese mills, they are higher than the Southern US or the nontraditional producing countries like Brazil. As the latter become more and more dominant in world export markets, Canada's competitiveness will diminish.

Regions with low fibre costs will clearly have a comparative advantage in the production of wood-intensive products like kraft liner. Figure 2-28 shows a regional cost breakdown for Canada and the primary competing nations. (Although it is not shown here, Japanese production costs are estimated to be approximately twice those of the US.) BC, the region with the lowest fibre costs, is clearly the Canadian region with a comparative advantage in the production of kraft liner.

A substantial cost differential holds between the producers of the US South and those of the Canadian regions. On average, Canadian production costs are at least 10% more than those of the US producers. Unlike its southern counterpart, Canada has only one world-class linerboard machine and, in most cases, does not have the economies of scale enjoyed by the US producers.

Figure 2-28
Estimated 1987 Regional Unbleached Kraft Liner Production Costs
(US$/tonne, delivered to Western Europe)



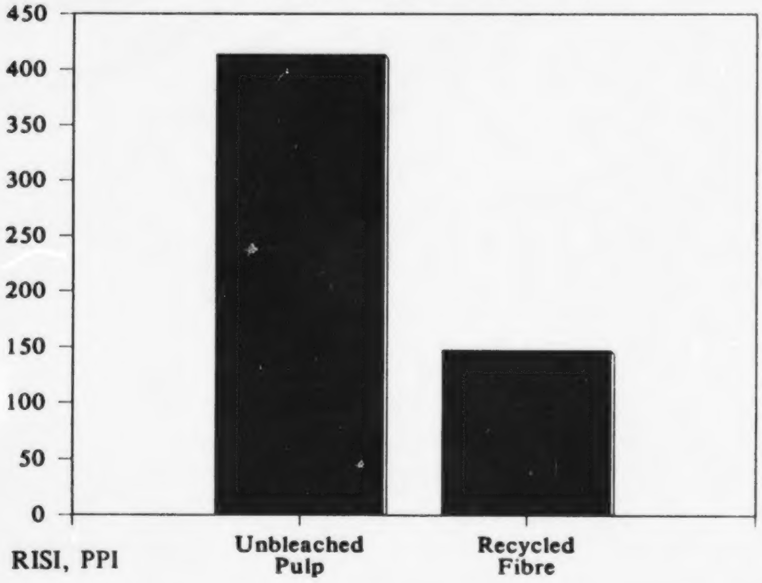
Source: WRA

The US South kraft liner industry is dominated by efficient, economy of scale mills, as discussed earlier. Historically, these producers have met a large share of domestic demand, in addition to supplying the export market. Brazil is also in a good position to produce and export kraft liner, but mill owners there currently prefer to invest in bleached eucalyptus kraft pulp. In the long term, however, it is very likely that Brazilian capacity in kraft liner will increase dramatically. Other potential low-cost suppliers such as Chile, New Zealand, and South Africa may also present a threat to the market shares of the traditional linerboard suppliers.

If Rule 41 is eliminated, or modified to put more emphasis on stiffness properties (as discussed earlier), the use of recycled fibre as a furnish for linerboard will increase considerably in the US (see page 113 for background on Rule 41). Recycled furnish is best suited to the production of higher basis weight linerboard and this market is expected to be dominated by US producers who have access to an abundance of secondary fibre.

The use of secondary fibre as a furnish can certainly give producers a cost advantage. Figure 2-29 shows the savings on furnish costs to be gained from using recycled fibre.

Figure 2-29
1987 Cost Comparison of Unbleached Kraft Pulp and Secondary Fibre
(US$/tonne, delivered in US)



Source: RISI, PPI

While use of secondary fibre as a furnish will lower Canadian production costs, it is not expected to significantly affect the competitiveness of Canadian producers in export markets. Because of a lack of domestic recycled fibre, many Canadian testliner producers are compelled to import it from the US - at a premium over what US producers pay. This is one reason the US imports very little Canadian testliner. Furthermore, regions like Western Europe and Asia are increasing their own production of testliner, thereby reducing import requirements. Canadian producers of testliner will be able to hold their own in the domestic market because of lower costs, and expand modestly in some export markets.

Clearly, Canadian producers can make few inroads into the US market with commodity grade linerboard. Canada is currently a marginal supplier of unbleached kraft liner to the US and heavy competition will persist in this market, particularly if Rule 41 is modified. Thus, to gain a niche in the US linerboard market, Canadian mills must focus on the production of high quality specialty grades, preferably those with lower basis weights.

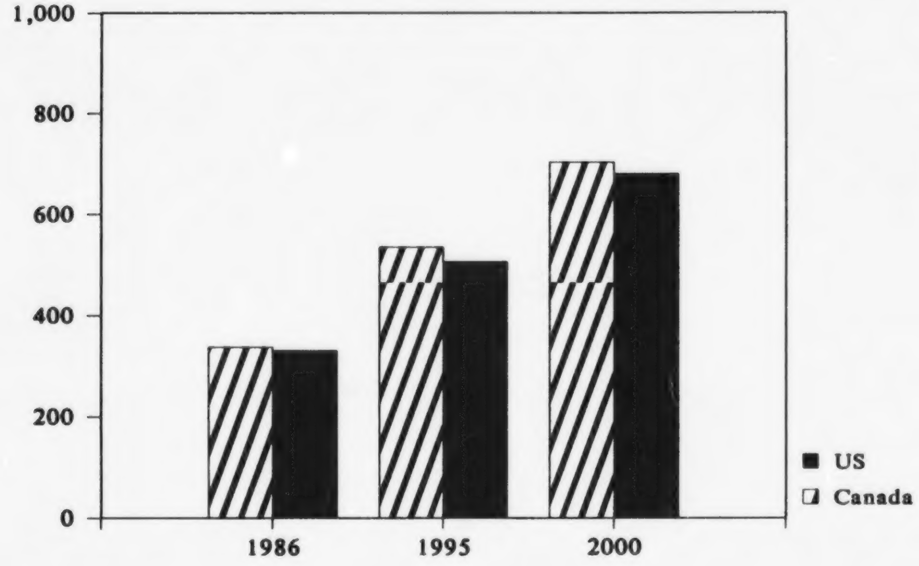
While the cost of producing a specialty grade, such as white top kraft liner, is higher than for unbleached kraft, Canada currently has an advantage over US producers. Because of its advantage in large, economy of scale operations in unbleached grades, US producers have focused very little effort on the production of any other kind of liner. Presently, there is only one US producer of white top kraft liner and one machine scheduled to come on stream in the next four years. Moreover, very few major US mills are integrated with a BKP supply. It is evident that, in the medium term, a gap will grow between domestic demand for, and supply of, white top liner. There is an opportunity for Canadian producers to fill this gap.

Future export opportunities in Western Europe are not promising. This region is becoming more self-sufficient in both test and kraft liner, and the Nordic suppliers are increasing their share of this market at the expense of their North American competitors. Transportation costs are a major component in linerboard and the Nordic suppliers have a natural advantage in the Western European market. Ocean shipping rates are expected to increase sharply over the next few years, further eroding the cost competitiveness of Canadian linerboard in Europe.

The story is slightly different for kraft papers. The US is the largest export market for Canadian producers of kraft papers, in particular multiwall sack kraft. In recent years, shrinking demand in this market, and subsequent low utilization rates, induced many American producers to withdraw capacity and a balance between supply and demand has been restored. However, the existence of swing capacity has fueled price (and profit) volatility in North America in the past, and this is likely to happen again in the future.

In addition to shrinking future demand, it must be observed that Canada is at a cost disadvantage vis-a-vis its US counterparts in the kraft paper industry and this is expected to continue in the short and long term (see Figure 2-30). While Canadian producers of kraft papers will continue to have lower energy costs, the US South will maintain lower wood and labour costs. Thus, Canadian producers will be uncompetitive in commodity-grade kraft paper in the US market.

Figure 2-30
Kraft Paper Production Average Variable Costs
(US$/tonne, delivered)



Source: RISI

If Canadian producers of kraft papers wish to capture a larger market segment in the US, they must export high-value specialty grades. In absolute terms, the US market for these grades is expected to grow in the medium and long term, and will show less volatility than that of commodity-grade paper.

Specialized containerboard and kraft packaging papers can generally command high prices, if they meet specific customer needs. Buyers are willing pay a higher price to ensure a constant source of supply of a difficult-to-find item, whether it is from Canada or the US.

National Implications

In the past, the Canadian kraft paper industry has focused largely on the production of commodity and 'semi-commodity' grades, and has met with a degree of success, both at home and abroad. However, global shifts on both the demand and supply sides have introduced new dynamics into this market, and Canadian producers can no longer rely on the status quo. New products and innovations are now required to meet the challenges presented by fibre constraints, demand shifts and the emergence of low-cost producers into the world market.

Historically, Canada's abundance of wood fibre has allowed producers to continue with the manufacture of low-value, commodity grades. But the fibre scenario has changed dramatically, and the pending wood fibre shortage is now forcing Canadian producers to become more efficient in the allocation and use of wood fibre.

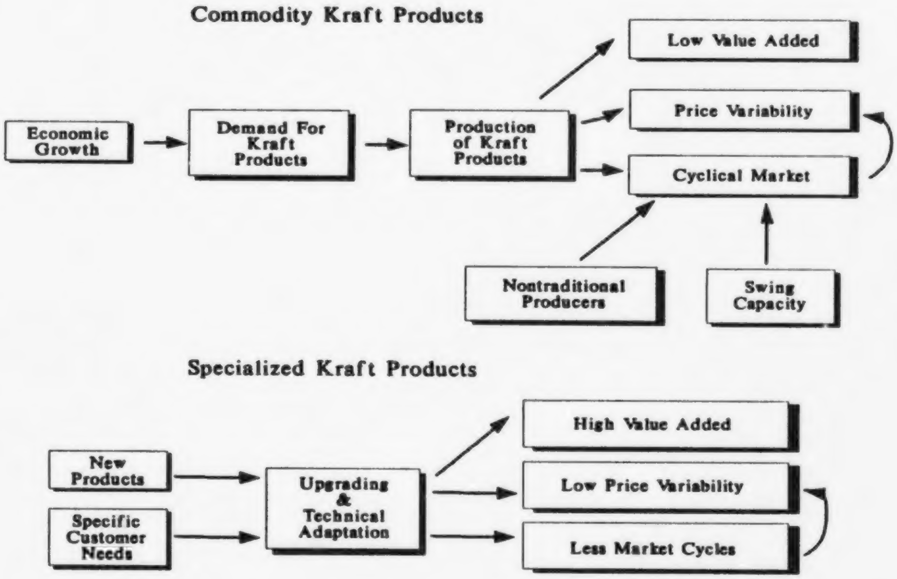
The North American containerboard and kraft packaging paper industry has been exceptionally prone to cyclical prices and profits, for reasons discussed earlier, and this is likely to continue in the low-value grades. As Figure 2-31 illustrates, economic growth drives the demand for commodity containerboard and kraft packaging paper, and the industry responds to these demand fluctuations. Therefore, the market is of a cyclical nature to begin with, and this is further exacerbated by the existence of swing capacity, and the growing presence of low-cost producers in the world market.

Specialization into higher-value containerboard and kraft packaging paper can change the dynamics of the kraft paper industry, and minimize market cycles. By actively seeking specific customer requirements and adapting technology to meet these needs, the industry can assume an aggressive position in the world market, and profit accordingly. Higher-value and specialized products exhibit lower price variability, and the market is of a more stable nature.

Specialized grades of linerboard, such as white top, is a promising opportunity. There has been rapid growth in the demand for printable, high quality white top, especially in the US, and growth will continue to be strong in this market. Very real market niches await for Eastern or Western producers who choose to specialize in these grades of linerboard, and who respond quickly to US demand.

This is also the case for kraft papers. As world demand for sack kraft continues to dry up in the medium term, some Canadian capacity for this product will have to be withdrawn, or upgraded to higher quality linerboard. However, strategic options are present in the production of higher-value kraft papers. For producers who choose this option, it will be necessary to gain a thorough understanding of customer requirements in very specialized markets. This will pay off in higher and less cyclical profits.

Figure 2-31


Commodity Kraft Products
Economic Growth
Demand For Kraft Products
Production of Kraft Products
Low Value Added
Price Variability
Cyclical Market
Nontraditional Producers
Swing Capacity
Specialized Kraft Products
New Products
Specific Customer Needs
Upgrading & Technical Adaptation
High Value Added
Low Price Variability
Less Market Cycles

The demand growth for commodity containerboard and kraft paper is currently strong in developing nations like Asia and Africa, but there is little doubt that this type of growth is over in the North American and Western European markets. In the long term, little opportunity exists in the developing economies for North American producers, because of the stiff competition in these markets by new low-cost exporters. Canadian producers who wish to hold and increase their share of the North American and export kraft product markets have several options:

- increase their competitiveness in commodity markets by keeping costs low (i.e., using secondary fibre, or developing economies of scale in production);
- upgrade to bleached grades of linerboard and kraft paper;
- specialize to meet specific customer requirements.

Clearly the best strategic choice for the Canadian kraft product industry lies with a combination of these options.

The pending free trade agreement between Canada and the US will have a profound impact on Canada's ability to compete in many products. In theory, free trade results in a net gain for the participants, but only if they specialize in those products in which they have a comparative advantage. As Canadian fibre costs increase in the future, it will become less feasible to export, or perhaps even produce, wood-intensive products such as kraft liner and sack. Thus, while Canadian producers can maintain their market shares by lowering costs with recycled fibre, and focusing on specialized niches, the question ultimately arises: should we continue to manufacture products in the long term in which we have no comparative advantage? Yes, if the dynamics of the marketplace allow innovative producers to compete through product innovation and astute marketing.

Regional Implications

Western Canada

The most promising markets for Western Canadian producers of containerboard and kraft papers are Japan and the US. There is an anticipated demand increment of 500,000 tonnes for white top liner in Japan by the year 2010; over the same time period, there is an expected demand increment of approximately six million tonnes in the US. The West is expected to show one of the highest population growth rates in the US in the years to come, thereby accounting for a substantial share of overall US kraft liner demand.

Currently, BC is the biggest Canadian exporter of linerboard to the Japanese market. Given the anticipated demand increment for white top kraft liner in this market, it is not unreasonable to expect that at least 5% of this increase will go to a BC producer. Certainly this does not warrant additional Canadian capacity, but some existing capacity (most likely sack kraft) could be upgraded to meet this demand increment.

The dramatic slowdown in world sack kraft demand suggests that one of the Western producers will be compelled to rationalize the production of sack over the long term. However, demand in the Western US and Japan is growing for white top grades of both linerboard and bleached boxboard, and this presents a strategic opportunity to the Western producer who chooses to upgrade. We believe that there is an opportunity in the US and Japan for the 100,000 tonnes of existing sack capacity in Western Canada if it were converted to bleached boxboard (SBS) or some other bleached paperboard grade.

Ontario

Because of diminishing competitiveness in the Western European market, Ontario producers of linerboard have been moving out of this market, and concentrating on supplying the domestic market in which it has a geographic advantage. Between 1985 and 2010, there is a projected kraft liner demand increment of 300,000 tonnes in Canada, and it is assumed that a sizeable percentage of it will be in white top specialty grades. It is believed that this incremental demand can be met with a new white top liner machine in Ontario, with a capacity of 250,000 to 300,000 tonnes.

No changes are suggested for existing capacity in kraft paper and corrugating medium. The latter is a low-value product in which Canada has little comparative advantage. However, it is believed that the existing capacity for kraft papers can be made more profitable by specializing in grades suited to specific customer needs.

If a producer is to market new specialty grades of kraft paper effectively, it is important to thoroughly know the requirements of the customer, because of the specialized nature of the product. In this sense, it is very different from market pulp or newsprint. Buyers prefer to spread their paper purchases over a number of suppliers, and would likely welcome Canadian sourcing.

Opportunities may lie in specific grades such as the following:

- steel interleaving
- glass interleaving
- butcher wrap
- silicone-release base paper
- grease-resistant paper
- corrosion-resistant paper
- mould-resistant paper
- fire-retardant paper
- military camouflage paper
- agricultural use

- one-time carbonizing
- gumming paper
- twisting
- sandpaper base
- laminating grades
- saturating grades
- extensible grades of sack kraft

Europe already has many producers of these specialized grades, and for this reason the US is perceived as the only promising market, particularly the Eastern and Midwestern US. Thus, due to a geographic advantage, the best opportunities will be for exporters in Eastern Canada.

Quebec

Given the serious fibre constraints in Quebec, no additional capacity for containerboard and kraft packaging paper can be foreseen. Any additional capacity in Quebec is likely to be in high-yield, high-value products, which optimize the allocation of a shrinking wood resource.

On this note, an additional white top linerboard machine can be suggested strictly as an opportunistic possibility. A white top kraft liner demand increment of 1.25 million tonnes is anticipated in the US over the period 1985 to 2010. We believe that Canada can capture 20% of this new demand, which translates into a new machine with a capacity of 250,000 tonnes. Although it is the largest eastern producer of linerboard, most of Quebec's production goes toward domestic demand, and one quarter is exported. Therefore, any substantial addition to linerboard exports from Quebec would likely require a new machine.

The US market opportunity could be profitable to linerboard producers integrated to BKP, who wish to export a larger share of their product to the US.

No increase in the existing capacity for kraft papers is recommended for Quebec. However, like Ontario, more profitability can be attained in both domestic and export markets by upgrading to specialized products.

Atlantic

The Atlantic region has a very small containerboard and kraft packaging paper industry, producing mainly corrugating medium. A limited availability of additional fibre for growth in this region makes any further capacity increase in containerboard and kraft packaging paper a poor strategic option.

3

NEWSPRINT

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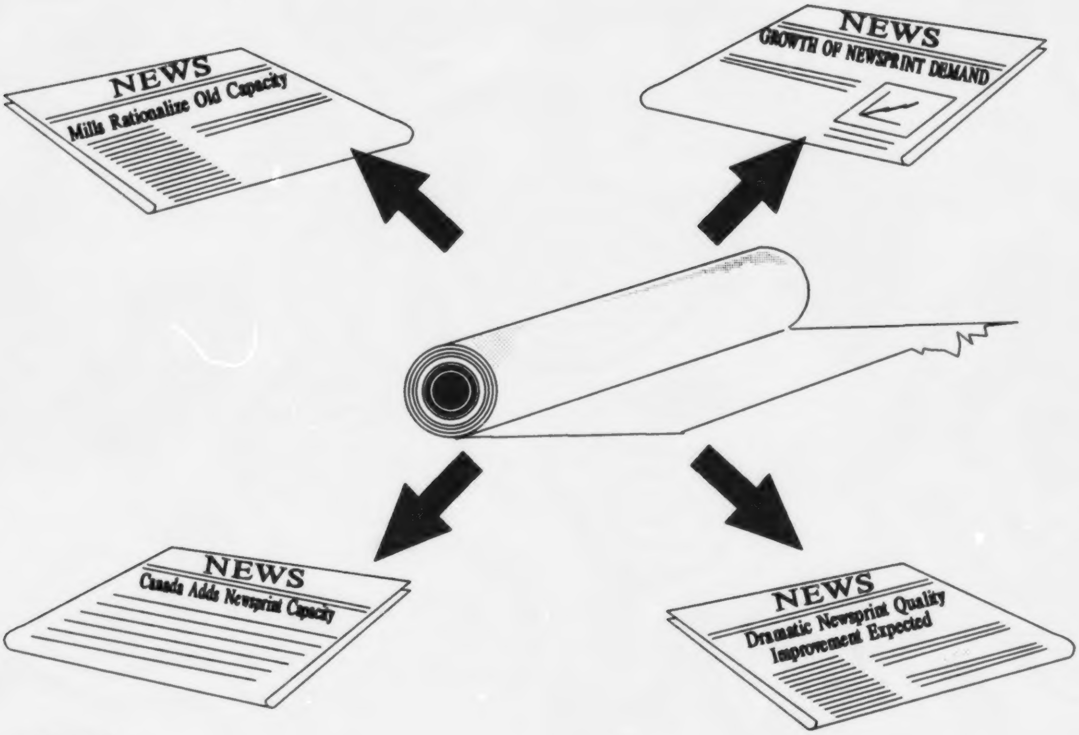
NEWS
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NEWS
GROWTH OF NEWSPRINT DEMAND
NEWS
Canada Adds Newsprint Capacity
NEWS
Dramatic Newsprint Quality Improvement Expected

Overview

Newsprint will continue to be an important strategic commodity forest product for Canada. The pulp furnish and quality requirements for newsprint will change rather dramatically over the forecast period. Increased power and reduced fibre requirements as a result of the move to TMP, will complement our low cost hydro electricity and increasing wood costs.

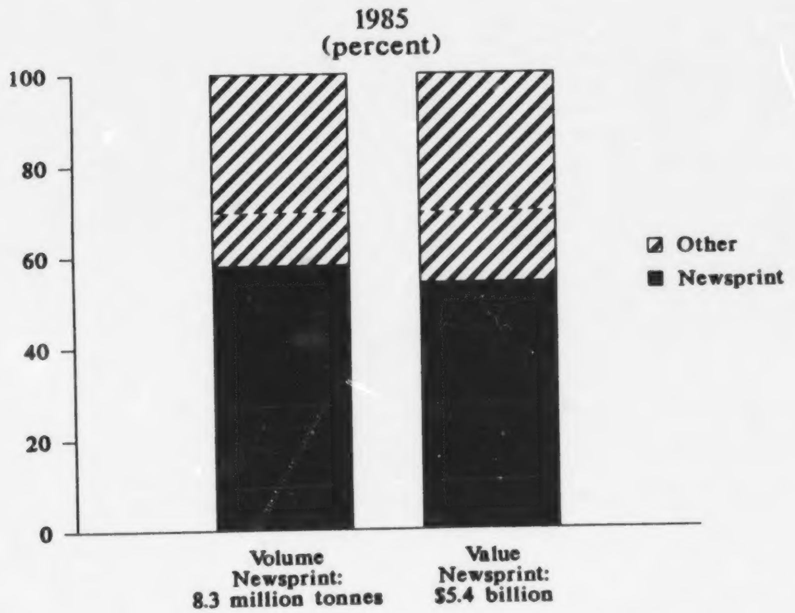
Demand will outstrip Canada's ability to supply newsprint cost effectively and competitively. This is a direct result of the forecast fibre supply limitations. A "limited" fibre availability scenario with its inherent return to fibre economics could revolutionize the newsprint industry. Newsprint will have to compete with other products for available fibre. Only the most competitive mills/machines will survive. To compete internationally, Canadian newsprint machines must have economy of scale and ability to produce the anticipated improved quality requirements. This evolution is well underway in Western Canada and Atlantic Canada, and to a lesser extent in Ontario and Quebec. Massive restructuring of the many small, inefficient and technologically obsolete machines and/or mills in Ontario and Quebec will be necessary to ensure a worldwide competitive position for these regions.

Newsprint will provide a decreasing share of total Canadian paper and allied products export value in the future, as a result of the move to value-added grades. Canada's primary market will continue to be the US, with growing emphasis in the West. Asia will supplant Western Europe as Canada's No.2 market. As a result, regional capacity will be much more evenly balanced across the country than we see today, with a significant increase in average machine productive capacity.

Size and Nature of the Newsprint Industry

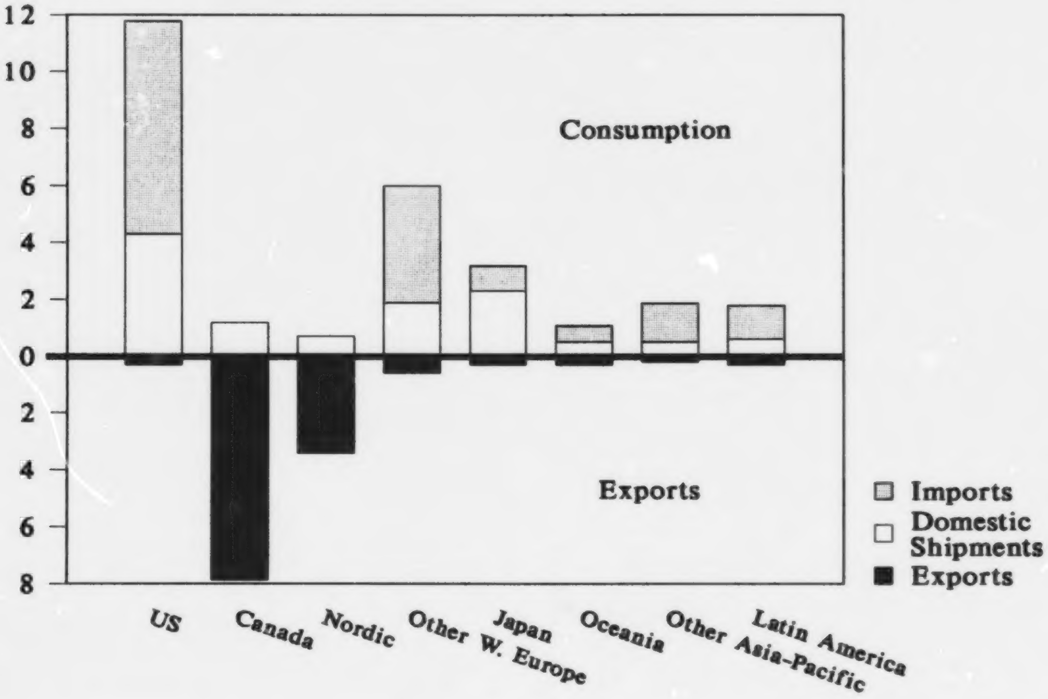
In 1985, newsprint accounted for 58% of Canada's paper and paperboard exports and 54% of the paper and paperboard export value (see Figure 3-1). Canadian exports of newsprint in 1985 were 8.3 million tonnes which accounted for 30% of newsprint world trade including 60% of the US market. Canada's dominant position with respect to newsprint shipments is shown in Figure 3-2.

Figure 3-1
Canada: Newsprint Share of Paper and Allied Industries Total Productive Capacity



Source: CPPA

Figure 3-2
1985 Newsprint Consumption and Trade
(millions of tonnes)



Source: WRA

Canada's newsprint capacity of 9.5 million tonnes (1985), comprises approximately 30% of the world capacity. World newsprint capacity by region for 1985 (actual) and 1989 (estimated) is shown in Table 3-1. World newsprint capacity in 1985 was 31.6 million tonnes. Capacity increases totalling 2.8 million tonnes are expected to be operational by 1989, resulting in a world capacity at that time of 34.4 million tonnes.

Table 3-1
World Newsprint Capacity
(millions of tonnes)

Region	**1985**	**Capacity Increases to 1989**	**1989**
North America	15.1	0.9	16.0
Europe	7.4	0.9	8.3
Latin America	1.0	0.1	1.1
Eastern Europe	2.6	0.1	2.7
Oceania	0.7	--	0.7
Japan	3.0	0.3	3.3
Other Asia	1.3	0.5	1.8
Africa	0.5	--	0.5
Total	**31.6**	**2.8**	**34.4**

Source: CPPA Newsprint Data 1985

The tight newsprint market of 1987/88 has caused a rapid escalation of the newsprint price which in turn has resulted in a wave of increased capacity. We now estimate the 1991 world newsprint capacity will be 37 million tonnes with Canada's share at 31%. In other words, over the period 1985-1991 Canada is expected to increase its share of world capacity by 1.0% (i.e. from 30.0% to 31%).

Technology

The technological revolution of the 1970s, which resulted in the cost efficient manufacture of newsprint from wood chips using the thermomechanical pulping process, is transforming the industry. Virtually all new newsprint capacity installed during or after the late 1970s used TMP as part (or in some cases, all) of the furnish. Traditionally, newsprint furnish consisted of stone groundwood (SGW) and chemical pulp, originally sulphite and later semi-bleached kraft (SBK). The use of these two components meant that roundwood for the SGW and a kraft pulp mill with its associated environmental problems and high capital cost were required. Because of the environmental problems, forest pulp mills tended to be remote from urban centres. Their economy of scale also resulted in the need for several newsprint machines to consume the output. In addition, the requirement for a roundwood resource for SGW resulted in the less than optimum utilization of the fibre in some regions.

Today this has all changed. While the economy of scale for newsprint machines continues to increase (i.e., 150,000 tpy in the 1960s to 220,000 tpy in the 1980s), the economy of scale for a newsprint mill has not changed significantly (350-000-400,000 tpy). Mills which once required three, four or five machines, now require only two. The use of 100% TMP for newsprint manufacture has resulted in a significant reduction in capital cost (i.e., no kraft pulp mill) and lower distribution costs (i.e., mills can be closer to the market because they don't have environmental problems).

All of these changes are having an impact on Canada's competitiveness. Prior to the development of TMP, Canada's dominant role in newsprint was a result of "unlimited" forest resources, a well developed infrastructure, economic and political stability, inexpensive hydro electric power and somewhat lenient pollution standards. There were few areas of the world (Nordic countries, New Zealand and the US) that could compete cost effectively with Canada. Now, however, several new areas of the world can compete head on with Canada including parts of Western Europe and Australia. We see the trend to more domestic newsprint production and increased competition from "non-traditional" sources continuing.

Canada, in general, has not yet taken full advantage of the available newsprint technology which has resulted in a loss of competitiveness. As an example, in Sweden, the use of TMP in newsprint is approaching 80%, with several mills producing newsprint with 100% TMP. Approximately 40% of Canada's newsprint furnish comprises TMP. The other significant technological change that has occurred in newsprint manufacture since the 1970s is twin-wire forming. Here again, Canada is slightly behind other major newsprint producing regions, with approximately 25% of its newsprint produced on fourdrinier machines. However, within the next few years we expect that virtually all Canadian newsprint will be produced on twin-wire type machines. There are several reasons for these disparities, including wood cost and form (i.e. chips or roundwood), availability of SBK capacity and availability of capital for modernization, to name a few. The point is not to compare who uses more TMP or who has more twin-wire machines, it is to show that the Canadian newsprint industry requires further modernization. It should be noted here that this modernization is progressing rapidly.

Quality

The standard of quality (i.e. as measured by brightness, opacity, printability and runnability) of newsprint is in the process of dramatic change. Newspapers in most developed countries are changing their philosophy from one of being a source of information and current news, which includes advertising, to the complete reverse, an advertising medium which includes news and information. Many newspapers can no longer view themselves as monopolies with little or no competition for their service or advertising potential. Magazines, cable TV and other printed material such as newspaper inserts and direct mail advertisements have created increased competition for the advertising dollar. The expansion of national newspapers in Europe, Japan, Australia and the US has created direct reader competition for the daily newspaper in addition to the competition for the advertising. Quite simply the newspaper business is changing and the traditional quality and service standards are changing as well. For example, runnability used to be the No.1 priority of newspaper publishers. Printability, opacity and brightness were important but there was little emphasis on improving these beyond the industry average, and certainly not if it meant a higher cost! Now, runnability is a given, and the improved process and quality control brought about with computer technology and generally higher standards has reduced the average break ratio from 5-10% to 1-2%. Newspaper publishers are now demanding something different (better) from the normal quality so they stand out from their competition, and they are willing to pay for it. The UK Today pays a 12% upcharge for "improved newsprint" from Sweden and USA Today pays a 3-4% premium for a better quality newsprint. The move to four-colour printing in daily newspapers has also increased the quality demand. For example, formation, dimensional stability, minimum two-sidedness, better opacity and higher brightness are required to make the 4-colour offset process effective competition to other print and electronic medias.

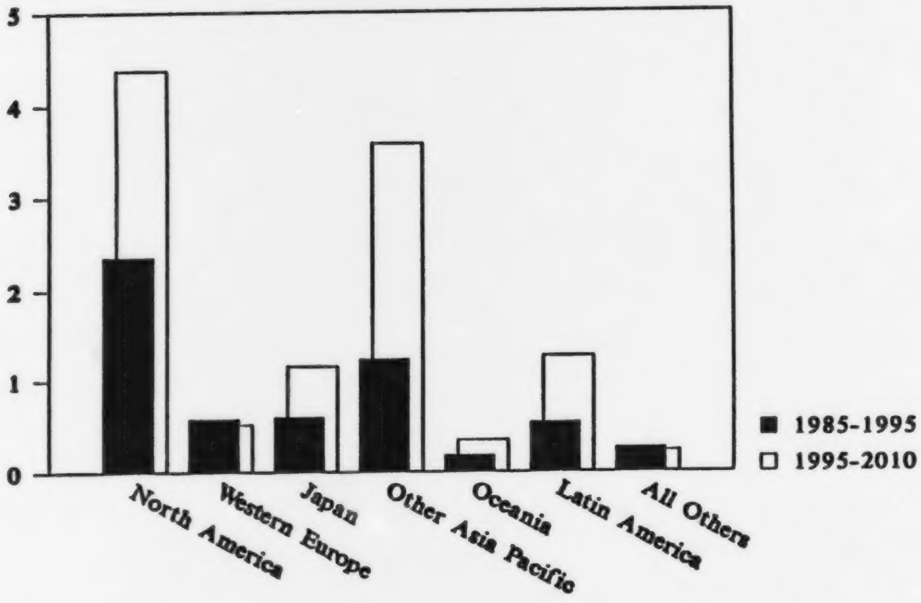
The newsprint industry tomorrow will bear little resemblance to the newsprint industry of the past. This revelation provides an opportunity for Canada to regain its leadership position in newsprint manufacture and development.

Analysis of Market

Global Demand Overview

Over the past 35 years, world newsprint demand growth has averaged 3.26% per year. World newsprint consumption tracked Gross Domestic Product (GDP) fairly closely through the 1960s. However, since 1970 newsprint consumption growth has not equalled GDP and we feel that this trend will continue for the forecast period. The newsprint demand forecast together with historical data is provided in Figure 3-3. Newsprint demand is expected to be 45 million tpy by 2010 up from 28 million tpy in 1985, which translates into a compounded annual growth rate of 1.9%. While the rate of growth may be slowing down, the absolute demand increase of 17 million tonnes is staggering.

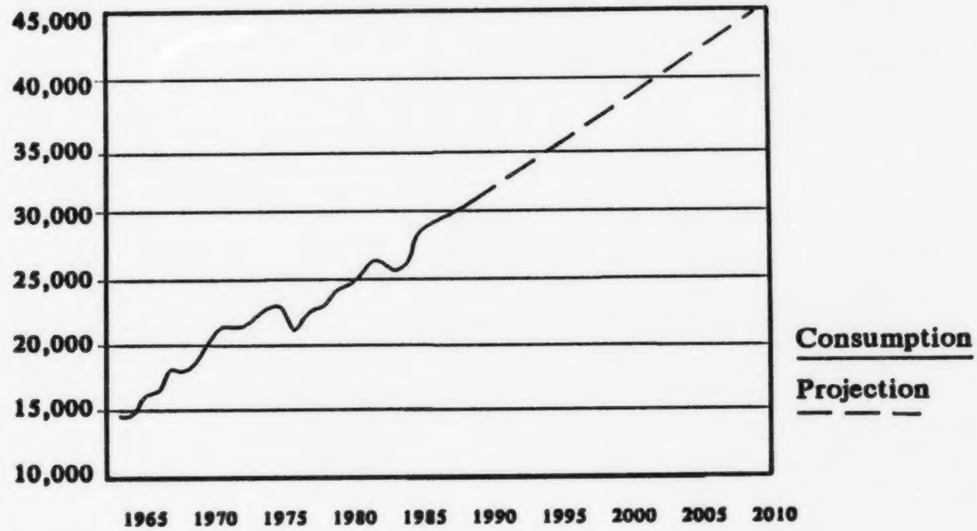
Figure 3-3
World Newsprint Demand
1985 - 2010
(thousands of tonnes)



Source: WRA

The breakdown of the world newsprint demand by market for 1985 is shown in Figure 3-4. As seen from this figure, newsprint consumption is dominated by Western Europe, Japan and North America. It is not surprising that these three markets, which are heavily dependent upon advertising to drive demand, have a high level of per capita consumption (25-45 kg/y). This compares to a consumption level of less than 5 kg/y in many developing countries where newsprint demand is limited due to much lower levels of literacy and advertising.

Figure 3-4
Newsprint Incremental Demand
by Market 1985-2010
(millions of tonnes)

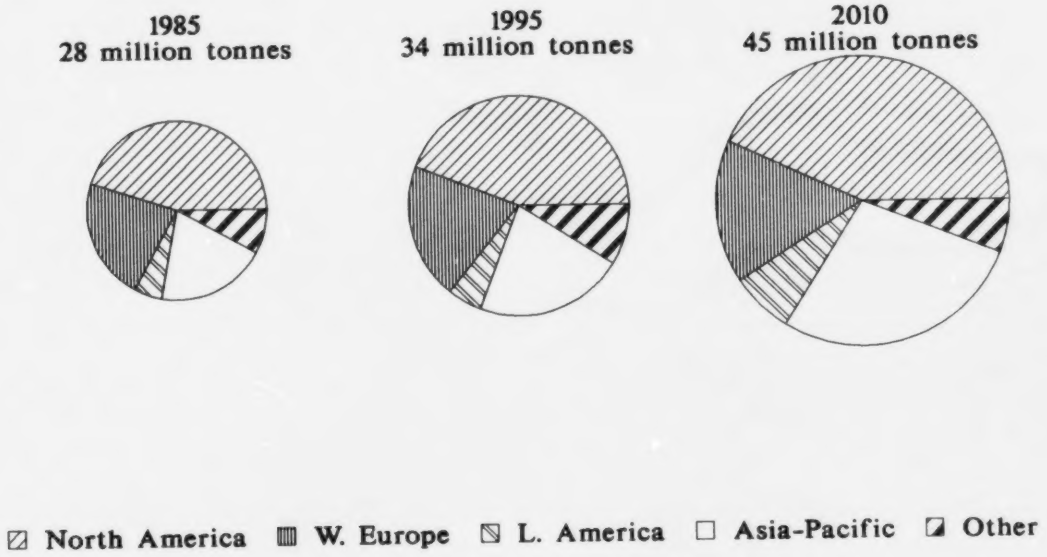


Source: WRA

This situation is also changing. The newsprint growth rate has increased more in developing countries over the last 10 years than in developed countries. Consumption in developing countries is still modest by comparison, which reduces the impact of the higher growth rates, but as the absolute consumption increases in these developing countries, the continued higher growth rates that are forecast will become increasingly significant with respect to demand.

The incremental global newsprint demand of 17 million tonnes (1985-2010) subdivided into the major markets is shown in Figure 3-5. In absolute terms, newsprint demand will be greatest in North America, Asia-Pacific countries, including Japan and Latin America, accounting for almost 90% of the incremental demand. This bodes well for Canada since historically, Canada has been the dominant or major supplier to these three regions. Put another way, Canada would have to add 1.5 million tonnes (8 machines) by 1995 and another 3.4 million tonnes (12 machines) during the 1996 to 2010 period if its current share of world markets (approximately 30%) is to be maintained. As of mid 1988, Canada has an announced net capacity increase of 1.5 million tonnes over 1985. To satisfy the forecast world demand growth, 30 new newsprint machines would be required to meet the anticipated growth of 5.9 million tonnes to 1995 and a further 50 new machines would be required to meet the growth in demand from 1996 to 2010. Overall, three new newsprint machines will be required each year to meet the growing world demand. However, the rapid increase of world newsprint capacity which has resulted from the current tight market conditions and high newsprint prices will create an oversupply situation in the short term. Worldwide operating rates will fall to the mid-80% level in the early 1990s. Canada, with its above average capacity expansion and export oriented position, will have a lower than average operating rate through this period. This could be a good opportunity for further newsprint machine and/or mill rationalization, resulting in the closure or conversion of those less efficient machines to "other" grades. This will be discussed more fully in the section dealing with regional implications.

Figure 3-5
Current and Projected
Newsprint Consumption
(millions of tonnes)



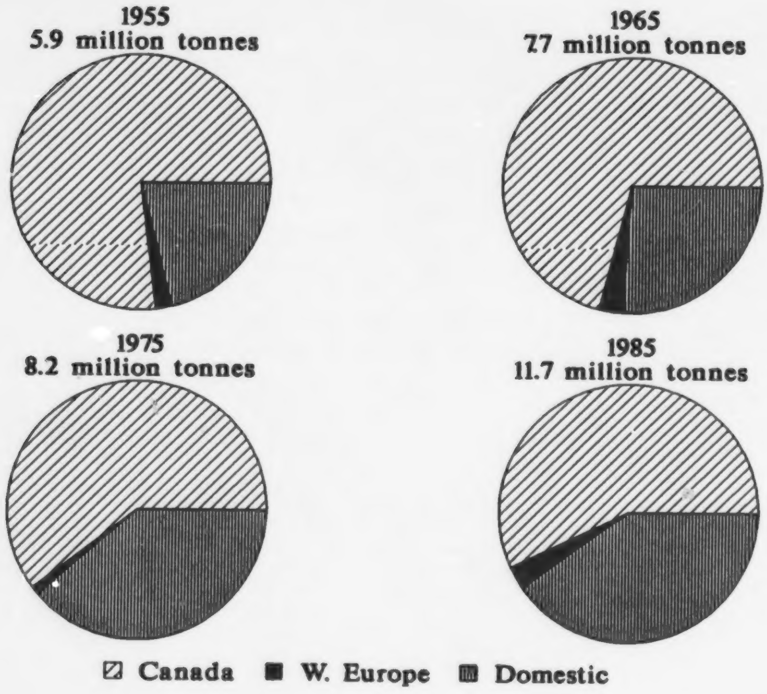
Source: WRA, CPPA, FAO

US

US newsprint demand is expected to reach 13.8 million tonnes by 1995 and 17.8 million tonnes by the year 2010. A large part of the incremental demand will be supplied by imports, mainly from Canada. Canadian mills remain the largest single source of newsprint supply to the United States. Canada's share of the US market has declined over the past 30 years, however, dropping from 76.9% in 1955 to 57.2% in 1985. Despite this drop in market share, the volume increased from 4.6 million tonnes 30 years ago to 6.7 million tonnes in 1985.

US newsprint mills have been steadily increasing their self-sufficiency; from 21% in 1955 to 40% in 1985. Figure 3-6 shows US sources of supply and consumption data for the period 1955-1985.

Figure 3-6
Sources of US Newsprint Supply and Consumption
(millions of tonnes)



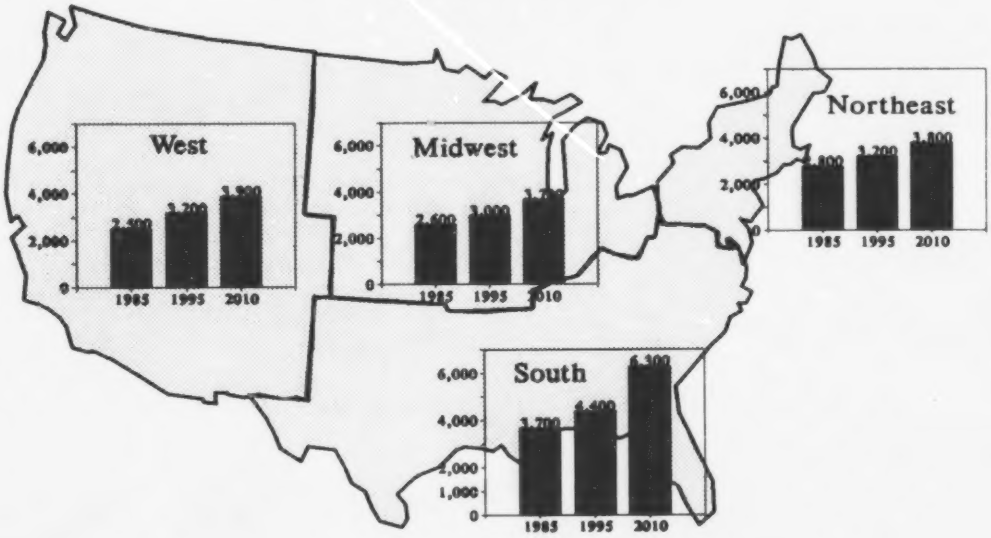
Source: WRA

The growth in US self-sufficiency is expected to level off in the near future and domestic producers are projected to maintain a 42% share through to 2010. The 40% share that the domestic suppliers currently hold is roughly 4.6 million tonnes, and while a 2% increase in this share may appear conservative, it represents a 1.2 million tonne increment to 1995 and an additional 1.5 million tonnes in the period 1996 to 2010. The majority of the domestic US supply will come from the southern regions where fibre is available and the population is growing the fastest.

Canadian producers' share, as previously mentioned, has declined as a consequence of the US capacity increase. Although Canada's market share may be deteriorating, the incremental volume will be significant. Canadian shipments to the US are projected to reach 7.7 million tonnes in 1995 and 9.6 million tonnes in 2010; increments of 1.0 million tonnes and 2.9 million tonnes over 1985 respectively. Offshore suppliers, currently from the Nordic countries, will see their shipments double from 350,000 tonnes in 1985 to over 700,000 tonnes in 2010. This will increase the market share of offshore supply from 3% to 4% over the same period. Historically, offshore supply was used to balance supply (from US and Canada) and demand, and the offshore market share fluctuated accordingly. However, in the future we see a slight increase in the supply from offshore as a consequence of the limited capacity in Canada due to a deficiency of incremental fibre for newsprint.

The growth of newsprint demand in the US is not uniform as can be seen in Figure 3-7. The US South and West regions are growing at a faster rate than the Midwest and Northwest regions. In absolute terms, the demand increase from 1985 to 2010 is expected to be 2.6 million tonnes in the South, 1.4 million tonnes in the West, 1.1 million tonnes in the Midwest and 1 million tonnes in the Northeast.

Figure 3-7
US Regional Newsprint Consumption
(thousands of tonnes)



The majority of the US incremental newsprint capacity to 2010 will be in the South. Thus we expect that much of the US South demand increase will be satisfied with domestic supply. To a lesser extent, the US Western region demand increase will be met with additional newsprint capacity in the US West.

Even with the increase in US capacity and the expected increase in offshore imports, the net incremental newsprint demand opportunity for Canada will be very good. We expect that the biggest opportunities for Canadian supply will be in the West and Midwest, but good potential also exists in the Northeast. Very competitive supply from the Southern domestic producers, coupled with pressure from offshore imports into the South (attractive freight rates from Europe to Southern US ports) will make it difficult for Canadian suppliers to compete there.

As can be seen from Table 3-2, daily and Sunday newspapers consume the largest amount of newsprint in the US, but over the past 10 years, their share of total consumption has been declining. In recent years, more of the US newsprint growth is in non-daily newspaper sectors.

Demand for other end-uses including weekly and business newspapers, inserts, flyers, penny savers, books and periodicals, increased to almost three million tonnes in 1985, or roughly 25% of total US newsprint consumption. This is almost double the consumption of 1.57 million in 1975.

Table 3-2
End-Uses of Newsprint in the US 1985

	000 Tonnes	% Total
Newspapers	8,762	75.2
- Dailies	6,046	51.9
- Sunday	2,716	23.2
Other Uses	2,886	24.8
- Weekly newspapers	1,184	10.2
- Inserts/flyers	733	6.3
Total Consumption	11,648	100.0

Source: ANPA/WRA

Pre-printed inserts and flyers are the largest single non-newspaper end-use for newsprint, taking 6% of total consumption in 1985. Increasing quality requirements, however, will see standard newsprint lose market share in this end-use category to higher quality newsprint grades, groundwood specialties such as MF and SC and LWC. Therefore, while US newsprint consumption is growing, it is becoming more dependent on non-newspaper end-uses. Given that these end-use products are demanding higher quality papers, newsprint growth in the US is becoming more vulnerable to competing grades.

In addition to the encroachment of these other grades in the commercial printing sector, the very nature of the daily newspaper is changing in the US. Traditional quality standards are changing as a result of recent shifts to higher levels of print quality and higher and lower basis weights as dictated by advertisers. These factors are breeding fragmented new categories of "improved" or "upgraded newsprint".

The current market for newsprint is essentially split into two grades: standard newsprint and the USA Today specifications with the latter category only representing a very small percentage of the total consumption at present. This situation is expected to change significantly. The daily newspaper is facing increasing competition from other print and electronic media for the advertising dollar and people's attention. This situation is forcing the daily newspaper publishers to improve the quality of their product. We have seen, and will continue to see, an increase in four-colour printing for both advertising and other newspaper sections. This move to colour will require that newsprint be brighter, have higher opacity, be smoother and have increased dimensional stability. Given the manufacturing constraints of fibre species availability and thermomechanical pulping, newsprint producers will likely be required to use peroxide bleached TMP and inorganic fillers to meet the combination of increased brightness and opacity.

Canada

Canadian newsprint consumption in 1985 was 1.03 million tonnes which translates into a similar per capita consumption as the US. Canadian demand is expected to parallel the growth in the US resulting in an additional 200,000 tpy in 1995 and 400,000 tpy in the period 1996-2010. The 600,000 tpy demand increment is roughly equivalent to three new machines. All of the Canadian demand will be supplied domestically.

As with the US, the Canadian demand growth will vary from region to region, with Ontario experiencing the largest increase. Fewer competitive pressures and a more conservative approach by daily newspaper publishers will result in less fragmentation of the Canadian newsprint industry as compared with the US. Quality requirements will, in general, increase but the brighter, partially filled grades and their proportionally higher prices will not gain a significant share of the Canadian demand.

Overall, as newspaper publishers strive to improve the quality of their product, they are paying increasing attention to the quality of newsprint. The increasing importance of four-colour printing gives newsprint brightness added significance. Brightness is one of the major complaints by publishers and, of all the quality parameters, is expected to change the most over the next five years.

In North America, 30-lb (48.8 g/m^2) newsprint is still the industry standard. However, some newspaper executives expect a drop in basis weight over the next five years, especially if flexographic printing technology gains ground on offset and letterpress. Lower basis weight newsprint will have to retain the opacity of higher weight newsprint which will result in the use of fillers. Alternatively, other newspaper executives see basis weights increasing to provide better opacity and more "body" in an attempt to raise the image of the daily newspaper to capture more advertisers and readers. This divergence of opinion and strategy will undoubtedly cause increased fragmentation of the newsprint market.

Europe

Newsprint demand in Western Europe including the Nordic countries is expected to grow from 6.1 million tonnes in 1985 to 6.7 million tonnes in 1995 and 7.2 million tonnes in 2010. This translates into a less than 1% per year growth rate. However, this newsprint demand forecast does not include "improved" newsprint which falls outside the category definition of newsprint. The large majority of this demand will be satisfied from EEC and Nordic producers, leaving a small share for Canada. We estimate that Canada's share of the European newsprint market will decline marginally due to more favourable trade relations between the Nordic countries and Western Europe.

Most of the development work on "improved news" has been done in Sweden. Indeed, the Swedish newsprint industry is becoming recognized as the world leader in newsprint production technology. Over the last several years, Sweden has modernized their newsprint industry. In Sweden today, standard newsprint is produced on large, fast and wide machines. The average yearly capacity of a standard newsprint machine in Sweden is 155,000 tonnes, compared to 115,000 tonnes in the US and 90,000 tonnes in Canada. Most of the smaller machines were converted to the production of specialty newsprint grades and highly filled supercalendered (SC) papers.

Swedish newsprint production is concentrated in four companies with a total of five mills. Table 3-3 summarizes the Swedish newsprint industry in 1987.

Table 3-3
The Swedish Newsprint Industry 1987
(thousand tonnes per year)

Company	Capacity	
	Standard	Improved
Stora/Kvarnsveden	450 [1]	62
Hylte Bruk/Hytebruk	550 [2]	n/a
Holmens/Hallstavik	390	60
Holmens/Braviken	400 [2]	60
SCA/Ortviken	490 [3]	110
Total	**2,280**	**292**

[1] Projected capacity for 1988 is 615,000.

[2] Classified as standard newsprint, but low basis weights (40-42 g/m^2) could be deemed semi-commodity.

[3] SCA's total production of 600,000 tpy is now all standard newsprint, but 110,00 tpy can be produced as improved news.

Source: WRA

Based on recent announcements, Swedish "improved news" capacity can be expected to increase to approximately 540,000 tpy by 1988. At present, Western European consumption of "improved news" is about 500,000 tpy.

Following the West European example, newsprint of the higher quality will become more and more in demand in North America. This will provide an opportunity for innovative and progressive Canadian companies.

While standard newsprint is expected to show slow growth in Europe over the next five to ten years, "improved" newsprint should grow considerably more rapidly. Perhaps this is an area where Canadian markets could make positive inroads.

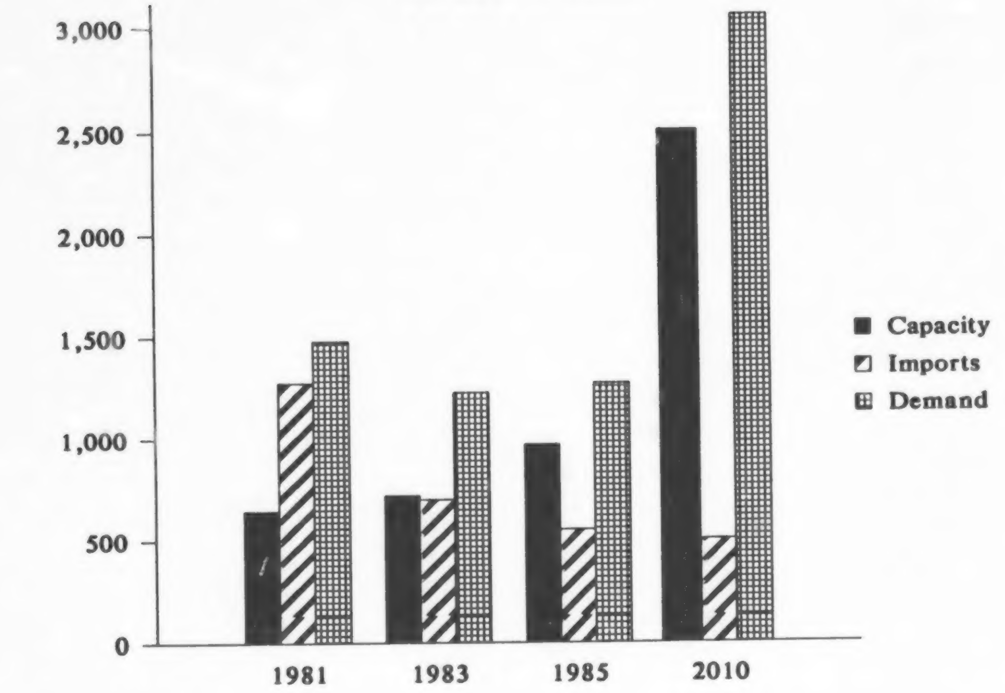
The short term supply/demand balance situation is very favourable for newsprint producers. Weak demand, low pricing and profits over the past several years halted new expansion in North America. However, significant capacity additions are forthcoming, and this, coupled with the low growth rate for standard newsprint which is forecasted for Europe, will result in a reduction of Canadian exports to 275,000 tonnes by 1995 and 250,000 tonnes by 2010. This will have an impact on the Atlantic producers and will result in a net decline of newsprint shipments from this area of Canada to Europe. This will be discussed more fully in the section dealing with regional implications.

Latin America

By 1985, newsprint demand for Latin America had not yet returned to the level achieved in 1981 (see Figure 3-8). For a variety of reasons, the Latin American economies had not recovered from the world recession, and this was reflected in their newsprint consumption.

Figure 3-8
Latin America
Newsprint Capacity, Demand and Imports

(thousands of tonnes)



Source: CPPA, WRA

Newsprint demand in 1985 was 1.27 million tonnes including 550,000 tonnes of imports. We expect there will be very high newsprint growth rates in this region, with demand reaching 1.8 million tonnes in 1995 and 3.1 million tonnes in 2010.

Capacity realization has been a continual problem in Latin America. For example, the official newsprint capacity in Mexico has never been attained with actual production. This situation explains why net imports have been greater than the difference between demand plus exports and capacity. In the future we feel there will be a reconciliation of this problem and attainment of capacity may be achieved.

By the year 2000, we anticipate that Latin America will increase newsprint capacity by 700,000 tonnes per year (i.e., one machine in each of Venezuela, Brazil and Chile). By 2010, Venezuela, Brazil, Mexico, Chile and Columbia will likely expand their capacities by a further 1.1 million tonnes resulting in a total Latin American newsprint capacity of 2.5 million tonnes. We have assumed the 1985 official Latin American capacity of 970,000 tonnes is rationalized to 700,000 tonnes of effective capacity.

Canada is the principal outside supplier to the Latin American region. In 1985, Norscan imports by Latin America were 525,000 tonnes with Canada supplying 350,000 tonnes or two thirds of the imports. Other suppliers to the region are South Africa, the USSR and Romania. The USSR's volume of approximately 35,000 tonnes went to Cuba. Total imports in 1986 are estimated at between 635,000 and 650,000 tonnes.

Canada will remain a major supplier to the Caribbean countries and Central America (even assuming Mexico adds capacity eventually) and an important supplier to South America. We forecast that Canadian export potential to Latin America will remain relatively flat at 400,000 tonnes per year for the longer term.

Asia Pacific

Newsprint demand in this region is expected to grow faster than any other region in the world. Exclusive of Japan and Oceania, growth is expected to average close to 5% per annum to the year 2010. This high relative growth will undoubtedly spur continued capacity additions in those countries that have the fibre resources and the necessary capital required to install newsprint capacity. Newsprint demand and import data are shown in Table 3-4.

Table 3-4
Asia Pacific Newsprint Demand and Imports
(thousands of tonnes)

	Gross Imports 1985	Demand			Annual Growth (%)	
		1985	1995	2010	1985-1995	1995-2010
Japan	330	2,740	3,340	4,500	2.0	2.0
Oceania	260	0,740	0,920	1,270	2.2	2.2
Other Asia Pacific	1,040	2,060	3,300	6,890	4.8	5.0
Total	**1,630**	**5,540**	**7,560**	**12,660**	**2.9**	**3.6**

Source: CPPA, WRA

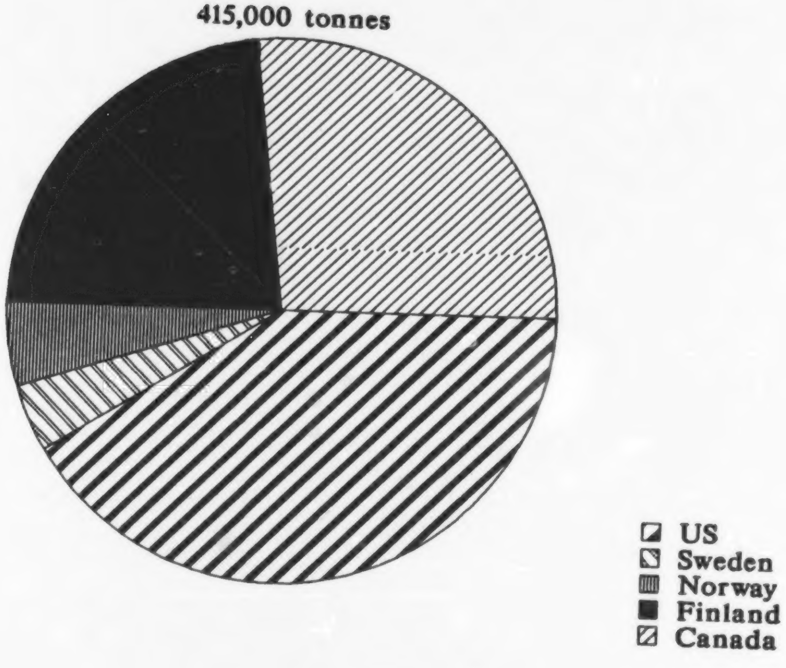
In 1985 the estimated total net imports for the region were 1.21 million tonnes (note that Table 3-4 lists gross imports rather than net imports). It is forecast that while capacity increases are occurring in Japan and likely in Oceania, Korea, SE Asia and other Asia (the Indian Sub-Continent), rapid growth in demand will mean that net imports will also increase dramatically in the Asian region.

Japan

Newsprint demand in 1985 was estimated at 2.74 million tonnes. Overall growth rates for newsprint in Japan have been modest in the last five years and the forecast is for growth at an average annual rate of about 2%. Newsprint demand in the year 2010 is thus estimated at 4.5 million tonnes. (Note that recent developments with respect to increasing domestic demand has seen newsprint demand growth of 4.5% in 1987.)

Japan continues to espouse a national strategy to move to value added paper grades. Theoretically, this means an increase in the import of newsprint and linerboard with corresponding increases in capacity of printing and writing paper, and higher value packaging grades. However, with respect to newsprint, Japan continues to add capacity. Japan has approximately 320,000 tonnes of newsprint capacity slated to come on line by 1989 and it seems quite reasonable to assume that another machine could be installed before 1995. In addition, Japanese companies are investing in Canada to secure newsprint capacity for Japan (e.g. Oji Paper Co.'s joint venture with CIP in Dalhousie and Canfor at Port Mellon).

Figure 3-9
Japan - Newsprint Imports by Origin
1986



Source: JPPA Statistics

The capacity additions, announced and anticipated, in the period 1985 to 1995, represent a growth rate of roughly 1.5% per year; less than the projected growth rate for consumption of 2%. The longer term (1996-2010) growth in domestic capacity is expected to drop to a level of 1.0-1.2% per year. Clearly, an increasing gap between domestic supply and demand means increasing dependence on imports. In fact, conservative estimates show imports accounting for 27% (or 1.2 million tonnes) of demand by 2010, while optimistic estimates put the volume closer to 2.0 million tonnes. If the current strategy of Japanese companies continues, we anticipate that much of the import volume will be from joint venture operations.

Nevertheless, assuming an import level of 1.2 million tonnes in 2010, a good opportunity for Canadian producers to increase their presence in the Japanese market exists, particularly given the small starting base of roughly 130 thousand tonnes (4% of total) at present.

The Japanese newsprint market is extremely quality conscious and service oriented, stressing very long term relationships. While newsprint prices in Japan are much higher (in US$) than those in the United States, the distribution and selling costs in Japan are also correspondingly higher. Currently net sales values to Japan are attractive partially because of the exceptionally strong yen. To be successful in the Japanese market, an exporting country must do business the Japanese way. For one thing, this involves selling newsprint in yen per ream (area measurement) as opposed to dollars per tonne, as in other markets, and to provide the customer's inventory at no direct cost. Due to the excessively high selling costs in Japan related to this way of doing business, large sales volumes are required to offset the high overhead costs. Companies interested in doing business in Japan should plan on a minimum of three to five years of development work before sales are initiated. The US is the largest offshore supplier to the Japanese market. There is an important role in US total exports through the joint venture between Weyerhaeuser and Jujo Paper. All of the newsprint that is imported from Norpac is sold by Jujo Paper Company.

Oceania

Newsprint demand in 1985 was 740,000 tonnes. Demand is expected to be 920,000 tonnes in 1995 and 1.27 million tonnes in 2010. This translates into an average annual growth rate of 2.4%.

Australia is expected to install one newsprint machine before 1995 and another before 2010. New Zealand is not expected to have enough incremental fibre until the late 1990s, to develop its newsprint industry further.

Imports into Oceania in 1985 were 136,000 tonnes. The major suppliers were from Canada and the three Nordic countries. Even though we expect Oceania to be more than self-sufficient with respect to capacity, it will continue to import newsprint. Australian publishers are wary of committing themselves 100% to local supply, due to potential problems with union and mechanical disruptions. We are, therefore, forecasting Canadian exports to this region to fall off from the 115,000 tonnes in 1985 to 75,000 tonnes in 1995 and 50,000 tonnes after 2010.

Other Asia Pacific

Demand in this area is expected to increase from just over two million tonnes in 1985 to almost seven million by the year 2010 (see Table 3-5). This vast region has been, and will likely remain, import dependent. Major importing countries include China, Taiwan, Hong Kong, Singapore, Malaysia, Thailand as well as the Indian sub-continent (other Asia). Thailand and Malaysia have the potential to add newsprint capacity but the other countries should continue to be long term newsprint importers.

Table 3-5
Other Asia Pacific Newsprint Consumption Forecast
(thousands of tonnes)

	Net Imports	Demand			Annual Growth (%)	
	1985	1985	1995	2010	1985-1995	1995-2010
China	280	680	940	1,530	3.3	3.3
Korea	--	220	360	760	5.1	5.1
Taiwan	60	120	170	280	3.5	3.4
Other SE Asia	450	540	930	2,120	5.6	5.7
Hong Kong	100	100	--	--	--	--
Singapore	60	60	--	--	--	--
Malaysia	110	110	--	--	--	--
Indonesia	80	110	--	--	--	--
Thailand	100	100	--	--	--	--
Philippines	--	60	--	--	--	--
Other Asia	240	500	900	2,200	6.1	6.1
Total	**1,480**	**2,600**	**3,300**	**6,890**	**2.4**	**5.0**

Source: WRA, Asian Development Bank

Indonesia has recently added two new newsprint machines and is now self-sufficient with the prospect of remaining so. The Philippines is also self-sufficient and is expected to remain so for the long term. The major markets of Hong Kong, Taiwan and Singapore are relatively mature and newsprint demand is expected to grow with GDP. However, the economies of these countries will continue to grow at a much higher rate than in North America and Western Europe and newsprint demand will in turn also grow at a much higher rate. Malaysian newsprint demand is expected to grow at an ever more rapid rate, as Malaysia, in addition to gaining newsprint demand through economic growth, will increase newsprint usage through increased literacy and population growth. Based upon current plantation programs, Malaysia could become self-sufficient by 2000. New plantation initiatives not yet developed, would be required for the same situation to occur in Thailand.

In the Indian sub-continent (Other Asia in Table 3-5), newsprint demand in 1985 was 495,000 tonnes with net imports of 228,000 tonnes. India has made a concerted effort to increase domestic production over the last five years. In this time period they have added 150,000 tonnes of newsprint capacity. It is expected that this drive to self-sufficiency will continue within the Indian sub-continent but it is not likely to be achieved by the year 2010.

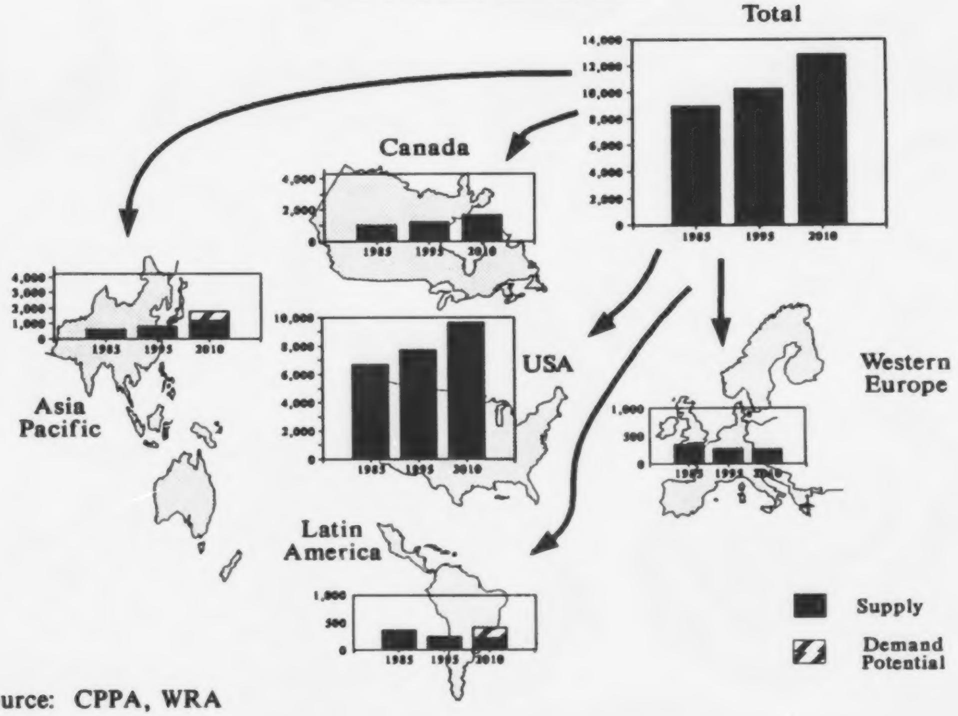
In 1985, newsprint demand in China was 677,000 tonnes of which 277,000 tonnes was imported. China has been a very erratic purchaser of newsprint and this policy will likely continue. The Chinese have proved to be very opportunistic buyers of newsprint. While they stress long-term contract relationships, they in fact buy on short term prices usually when prices are low. Therefore, successful sellers of newsprint to China must be very low cost producers. Major newsprint suppliers to China include Canada, New Zealand, South America and the Nordic countries. China will remain a large net importer of newsprint and is a good potential market for Canadian exports.

Canada, in 1985, had a 13.8% share of the total Other Asia-Pacific market or 24% of the imports. We forecast that the Canadian market share will be reduced to 6.5% (i.e., exports of 450,000 tonnes) by 2010 as a result of the limitation of fibre. The potential for Canadian exports in this region, assuming Canada maintained its 24% share of imports, would be 650,000 tonnes or the equivalent of one extra modern newsprint machine.

A summary of the preceding Canadian supply scenario is outlined in Figure 3-10. To repeat, the underlying assumptions are:

- Limitations of fibre which restricts newsprint capacity to 12.9 million tonnes;
- the North American market demand is Canada's first priority;
- Canada will retain a small presence in Western Europe;
- Canada's exports to Latin America will modestly decline;
- Canadian exports to the Pacific Rim will make up the difference and fall short of the demand opportunity.

Figure 3-10
Canadian Newsprint Supply



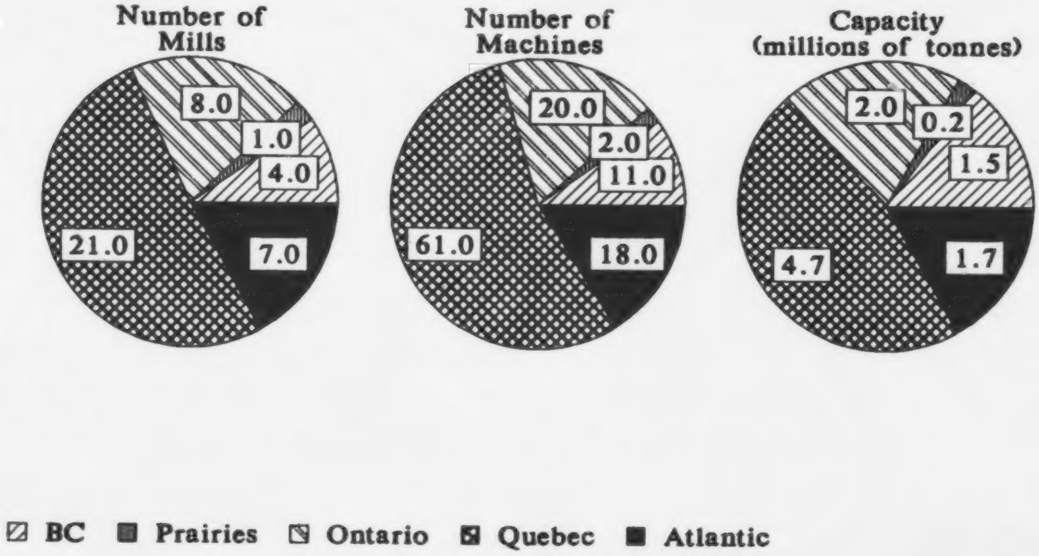
Source: CPPA, WRA

Canadian Industry Structure

As of 1987, the Canadian newsprint industry comprised 41 mills with 112 machines located in seven provinces. PEI, Saskatchewan and Alberta did not have newsprint capacity. Official Canadian capacity in 1987 stood at 10 million tonnes or 31% of world capacity, Figure 3-11 graphically portrays the regional capacities, mills and machines.

Figure 3-11

Regional Breakdown of the Canadian Newsprint Industry 1987



Two-thirds of the Canadian newsprint capacity is in Ontario and Quebec. The average capacity per machine in these two provinces is 83,000 tonnes per year. By comparison, the Atlantic provinces have 17% of the total capacity with an average capacity per machine of 95,000 tonnes. BC has 15% of the capacity and an average machine capacity of 136,000 tonnes.

It should be noted that a number of machines, mostly in Quebec, while listed in official statistics as newsprint capacity, are in fact producing groundwood specialties. We estimate that this capacity equates to approximately 600,000 tonnes.

Industry Transformation

Over the past six or seven years, the Canadian newsprint industry has been undergoing a transformation. Older, smaller machines have been permanently shut down or converted to groundwood specialties; they have been replaced by larger, faster and more efficient newsprint machines. This trend will continue. (See Table 3-6 for a partial list of past and future changes).

From 1980 to 1985, we estimate that 17 machines with a combined newsprint capacity of 900,000 tonnes were permanently retired or converted to other grades. During the same period, 10 new machines were installed with a combined capacity of 1.6 million tonnes. Canadian newsprint capacity (CPPA) in 1985 was 9.8 million tonnes. The average capacity per machine was approximately 95,000 tonnes, which is an improvement from 1981's average machine capacity of about 90,000 tonnes.

Table 3-6
Changes in Canadian Newsprint Capacity 1981-1991

Company	Mill	Tonnes	Machines	Year
Machine Closures/Product Changes				
Abitibi-Price	Grand Falls, NF	35,000	1	1982
Abitibi-Price	Iroquois Falls, ON	130,000	4	1983
ConBath	Shawinigan, PQ	40,000	1	1983
MB	Powell River, BC	135,000	2	1983/84
MB	Port Alberni, BC	200,000	2	1984-90
Ontario Paper	Thorold, ON	220,000	5	1983
Abitibi-Price	Iroquois Falls, ON	50,000	1	1985
Maclaren	Buckingham, PQ	160,000	2	1986
CIP	Gatineau, PQ	80,000	1	1986
Donohue	Clermont, PQ	40,000	1	1987
Abitibi-Price	Alma, PQ	60,000	1	1988
Abitibi-Price	Kenogami, PQ	75,000	3	1989
GLFP	Thunder Bay, ON	180,000	2	1991
New Machines				
Abitibi-Price	Stephenville, NF	170,000		1981
NBIP*	Dalhousie, NB (2)	200,000		1982
MB	Powell River, BC	175,000		1981
Abitibi-Price	Iroquois Falls, ON	175,000		1982
BCFP	Crofton, BC	180,000		1982
Crown Forest	Elk Falls, BC	180,000		1982
Donohue Normick	Amos, PQ	175,000		1982
Ontario Paper	Thorold, ON (2)	320,000		1983
Maclaren	Buckingham, PQ	170,000		1986
CIP	Gatineau, PQ	180,000		1987
Donohue	Clermont, PQ	180,000		1987
Finlay Forest	Mackenzie, BC	216,000		1989
Gold River	Gold River, BC	225,000		1989
Alberta Newsprint	Whitecourt, AB	220,000		1990
GLFP	Thunder Bay, ON	240,000		1991
Howe Sound	Port Mellon, BC	200,000		1991
Donohue	Amos, PQ	200,000		1992
Normic Peron	Val d'Or, PQ	220,000		1992

* Essentially new paper machines; only the dryer sections remain from the original machines and both received brand new twin-wire formers.

Source: Canadian Paper Analyst, WRA

Paper Machine Technology

Paper machine technology advances in the 1970s and 1980s have revolutionized newsprint production. First came the change from fourdrinier to twin-wire, followed by a significant advancement in computer control and lastly, dramatic increases in paper machine speeds. State-of-the-art newsprint machines in the late 1960s used fourdrinier technology, computer-assisted data collection and operated at 915 m/min. State-of-the-art newsprint machines in the late 1980s have twin-wires, are computer controlled and operate at up 1375 m/min. As a consequence, machine capacities have increased from 150,000 tonnes to 225,000 tonnes. Machine widths have increased 10% from 9.2 m to 10 m.

These rather dramatic changes were not occurring in isolation. Over the same period the newsprint consuming printing and publishing industries were also undergoing dramatic changes. Newspaper and commercial printing presses, like paper machines, were getting bigger and faster. Newspaper presses were changing from letterpress to offset. Commercial cold offset printers were expanding rapidly and installing new heat set offset presses. Newspapers were growing rapidly, as advertisers turned to the print media and away from television. The demands on newsprint quality (runnability, brightness, opacity and dimensional stability) increased accordingly.

As a consequence, standard newsprint must be made on a twin-wire or top-wire machine.

All of Canada's new newsprint machines installed after 1981 have twin or top-wire formers. In addition, many of the larger fourdrinier machines have been converted to twin or top-wire formers over the last five years. Approximately 26%, or 2.7 million tonnes, of Canada's newsprint is currently produced on fourdrinier machines. Of this total, approximately 60% is in Quebec, 15% in each of Ontario and the Atlantic provinces and 10% in BC. Table 3-7 summarizes by region, the number of machines in each category.

Table 3-7
Type of Newsprint Machines in the Canadian Newsprint Industry - By Region

Region	**Twin-Wire**	**Top Wire**	**Fourdrinier**	**Total**
Atlantic	4	10	4	18
Quebec	18	14	29	61
Ontario	3	10	7	20
Manitoba	0	2	0	2
British Columbia	4	4	2	10
Canada	**29**	**40**	**42**	**111**
Percent total	26	36	38	100

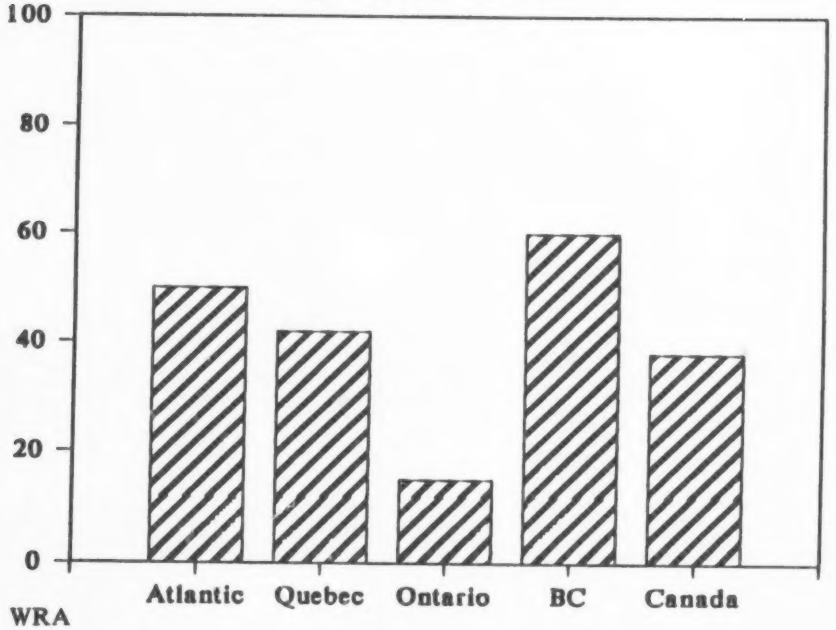
Source: WRA

We anticipate that virtually all standard newsprint machines over 100,000 tonnes will be converted to twin or top-wires by 1991.

Furnish Composition

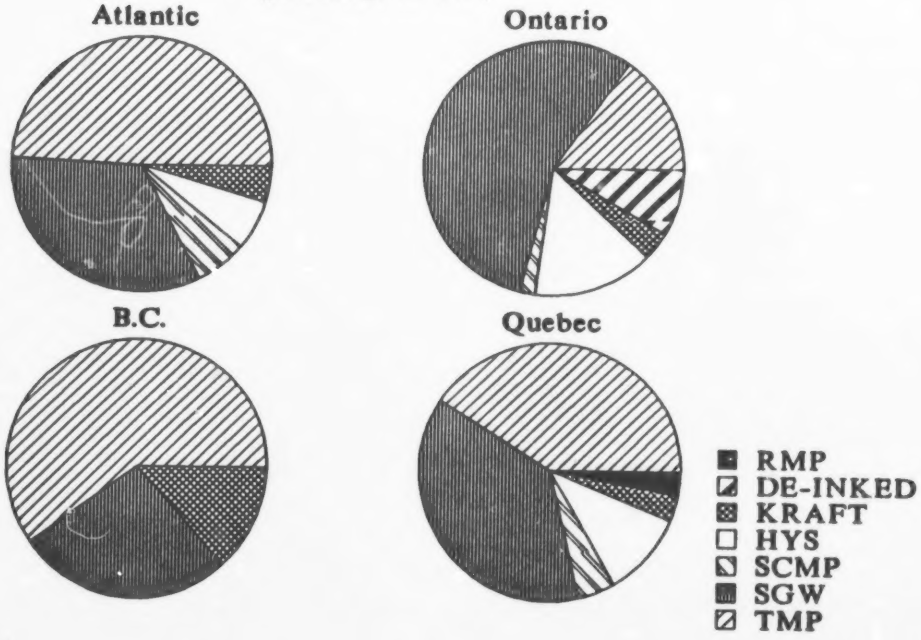
Technological developments in mechanical pulping and increasing wood costs are slowly changing the pulp furnish composition of newsprint from a mixture of semi-bleached kraft (SBK) or semi-bleached sulphite (SBS) and stone groundwood (SGW), to mainly (C)TMP. From a cost competitive viewpoint, all new newsprint capacity must use as much TMP as customers permit. Figure 3-8 summarizes the regional TMP usage in newsprint. Figure 3-9 shows the furnish components of newsprint by region. Ontario has the highest percentage of SGW, followed by Quebec, the Atlantic provinces and BC. Established mills which use a SGW and SBK or SBS furnish to make newsprint will convert to TMP as economics dictate. This will occur as wood costs increase, or opportunities to use the chemical pulp in value-added products are developed, or as inefficient chemical or stone groundwood pulp mills are rationalized. Eventually, most of Canada's newsprint will be made with 100% TMP.

Figure 3-8
Regional Use of TMP in Newsprint
(percentage of total)



Source: WRA

Figure 3-9
Regional Newsprint Capacity
By Furnish Composition
(percentage of total)

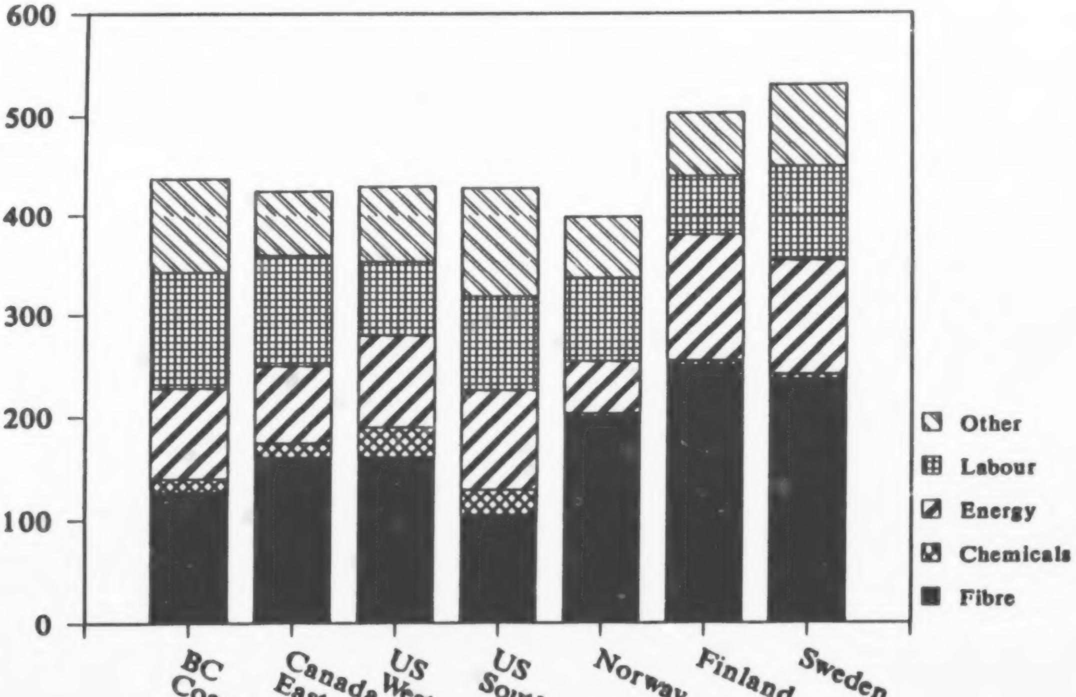


Source: WRA

Manufacturing Costs

Canadian newsprint production costs are competitive with the US and Nordic countries as shown in Figure 3-10. Each Norscan region has relative advantages and disadvantages with respect to costs. For example, Finland and Sweden have much higher fibre and energy costs than Canada, and partially compensate for these with lower chemical and labour costs related to their more productive newsprint machines. The Southern US has lower fibre costs, but also has higher energy and other costs compared to Canada. In 1987, Canada's competitive position was achieved as a result of relatively low electrical (hydro power) and fibre costs and a weak currency which offset higher labour costs related to less efficient newsprint machines.

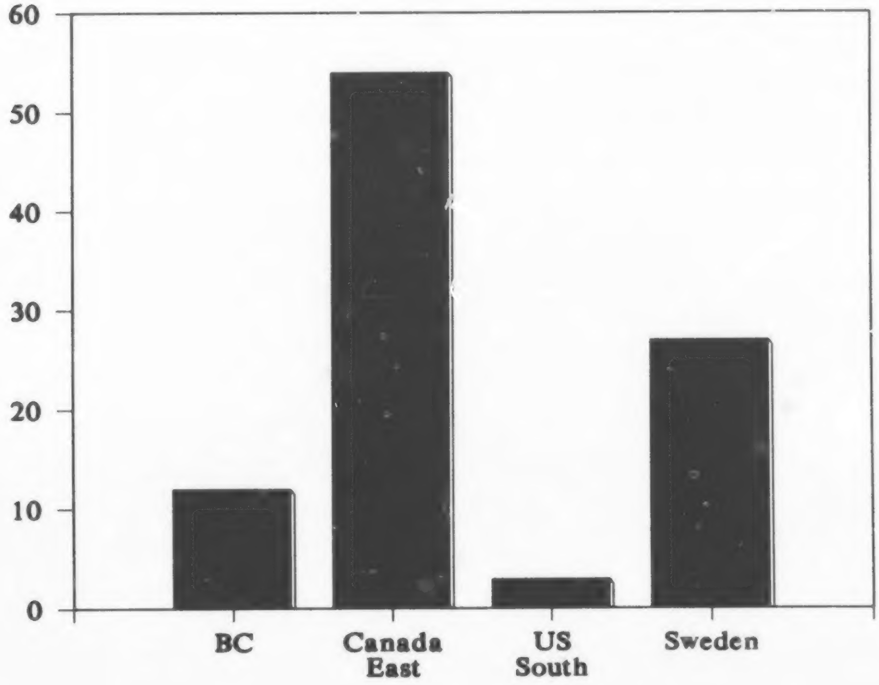
Figure 3-10
Newsprint Manufacturing Cost Breakdown
Major Producing Regions 1987
(1987 C$/tonne)



Source: Price Waterhouse, RISI

The higher wood costs and purchased pulp price of the Nordic producers has forced a restructuring in this region, resulting in conversions of smaller machines to higher valued mechanical pulp-based printing and writing papers and installation of new newsprint machines which are faster and larger (see discussion of machine size in previous section on Canadian Industry Structure). A similar trend with respect to rising wood costs is expected for Canada. Conversion or retirement of old, small, inefficient newsprint machines to mechanical printing and writing papers and replacing some of this capacity with new machines utilizing state-of-the-art technology could once again put Canada at the forefront of newsprint manufacture. The manufacturing cost savings that can be realized by installing new machines in each region is illustrated in Figure 3-11.

Figure 3-11
Manufacturing Cost Savings for Newsprint:
New Machine vs Existing Average Machine
(1987 C$/tonne)



Source: Price Waterhouse

Clearly, Eastern Canada would benefit the most by retiring or converting old newsprint machines and replacing them with new machines. Rising wood and labour costs will have to be compensated for with improved productivity if Canada is to maintain and/or improve its competitive position within the Norscan countries. Comparison of Canada's manufacturing costs with South America and Oceania shows even more clearly that Canada must have an ultra-modern newsprint industry to compete with these lower cost regions.

Distribution Costs

Canada currently enjoys reasonably competitive freight costs to the markets it serves. Obviously, the average freight cost for Canadian newsprint mills serving US customers is higher than for the US mills, but certainly less expensive than offshore supply. Freight costs from Canada to Southeast Asia and Japan are very competitive to corresponding rates from the Nordic countries and the US and lower than from Oceania. Canada suffers a distinct freight disadvantage to Europe and the Middle East when compared to European supply.

Ocean freight rates are expected to escalate faster in the next 10 years than they did in the past. The world forest products industry has enjoyed attractive ocean freight rates as a result of the significant oversupply of cargo capacity due to the world recession in 1981. This situation is now changing and Canada and its competitors will be faced with increased ocean distribution costs. We anticipate, however, that Canada's competitive freight position to Japan and Asia will not worsen and may improve slightly over the next 10-15 years as long as the net total trade remains positive from west to east (i.e., from Asia to North America).

Distribution costs within North America (rail and truck) are not expected to escalate to the same extent as the ocean rates, as a result of deregulation and the expectation of free trade. This will further enhance Canada's competitive position vis-a-vis offshore suppliers in the US market.

While distribution costs may increase slightly as a percentage of total costs, we do not foresee that Canada will be faced with an erosion of its competitive position to its main markets.

National Strategic Implications

Newsprint will continue to be a key strategic grade for Canada's pulp and paper industry. In addition to the obvious export of fibre, newsprint also provides another means to export hydro electricity, and therein underlays Canada's future competitive advantage. To take full advantage of this situation, Canada must continue its newsprint modernization program and achieve the economy of scale that is necessary to offset its reduced competitive position with respect to increased fibre and labour costs.

Newsprint quality requirements continue to be more demanding and the Canadian industry must anticipate and respond as required, in order to ensure its strong position in the US and other major markets.

Canada's fibre supply is not unlimited. Therefore, newsprint, like all other forest products, must compete on the basis of "return to fibre". Those products which return the most profit per m^3 of wood will eventually become the products of choice for the industry. Of course, many other factors (e.g. market size, technology, wood quality, etc.) play a role in determining the eventual product mix of the Canadian forest industry. Our view of the future Canadian newsprint industry is as follows:

- Complete rationalization of smaller, slower newsprint machines;
- continued improvements in brightness and opacity with a gradual reduction in basis weight;
- virtually all production with top or twin-wire formers;
- significant increase in the use of TMP. Minimal use of SBK and only where the SBK is integrated;
- more even balance of newsprint production across Canada, as a result capacity increases which will be more rapid in Western Canada;
- more selective marketing to ensure a minimal distribution cost for the industry as a whole (i.e. more North-South trade and less East-West);
- there will be increased competition (hence higher prices) for any incremental fibre. Additional newsprint production must be very efficient to justify the use of this higher priced fibre.

Projections for Canadian newsprint supply to world markets were summarized in Figure 3-10. The two key assumptions inherent in this supply scenario are that Canada will maintain an average 55% market share in the US and that fibre supply allocations will limit Canada's potential in the Asia-Pacific markets and Latin America. In 2010, given more newsprint capacity, Canada could supply 1.8 million tonnes to Asia-Pacific markets, compared to 1.2 million tonnes in our forecast and 400,000 tonnes to Latin America, instead of 200,000 tonnes as shown.

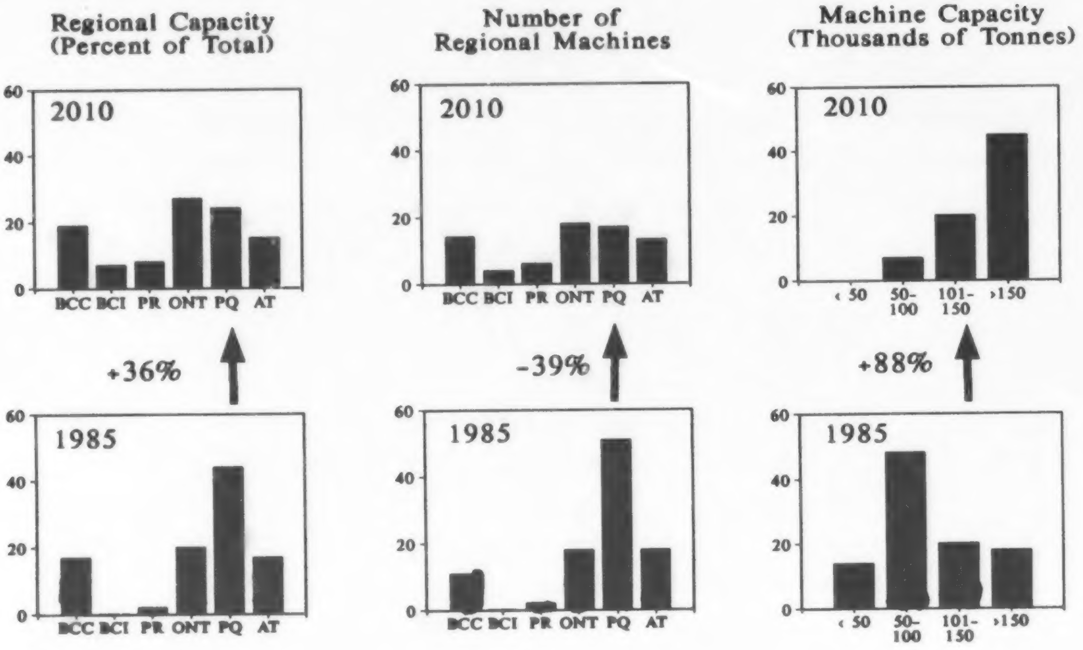
Regional Implications

Canadian newsprint capacity will increase 36% from 1985 to 2010, roughly paralleling worldwide newsprint demand growth. However, the Canadian newsprint industry is expected to undergo significant internal change which does not only reflect changes in market demand, but more importantly, changes in regional attitudes to the profitable utilization of available fibre.

The Canadian newsprint industry structure in 1985 and 2010 is summarized in Figure 3-12, and as mentioned above, newsprint capacity is expected to increase by 36% between 1985 and 2010. However, the resultant capacity will be much more evenly located across Canada, with significant capacity reduction occurring in Quebec and significant increases occurring in Ontario and Western Canada. The number of machines producing newsprint in Canada will drop by 39% from 1985 to 2010. Quebec, alone, will have a net reduction of 34 machines. Ontario will have the same number of machines but they will be much more efficient. Average machine capacity will increase by 88%, from approximately 95,000 tonnes per year in 1985 to 179,000 tonnes per year in 2010. In short, the Canadian newsprint industry will be very modern and efficient--a very necessary step to being competitive.

Figure 3-12

Canadian Newsprint Structure in 1985 and 2010



Regional Capacity (Percent of Total)

Number of Regional Machines

Machine Capacity (Thousands of Tonnes)

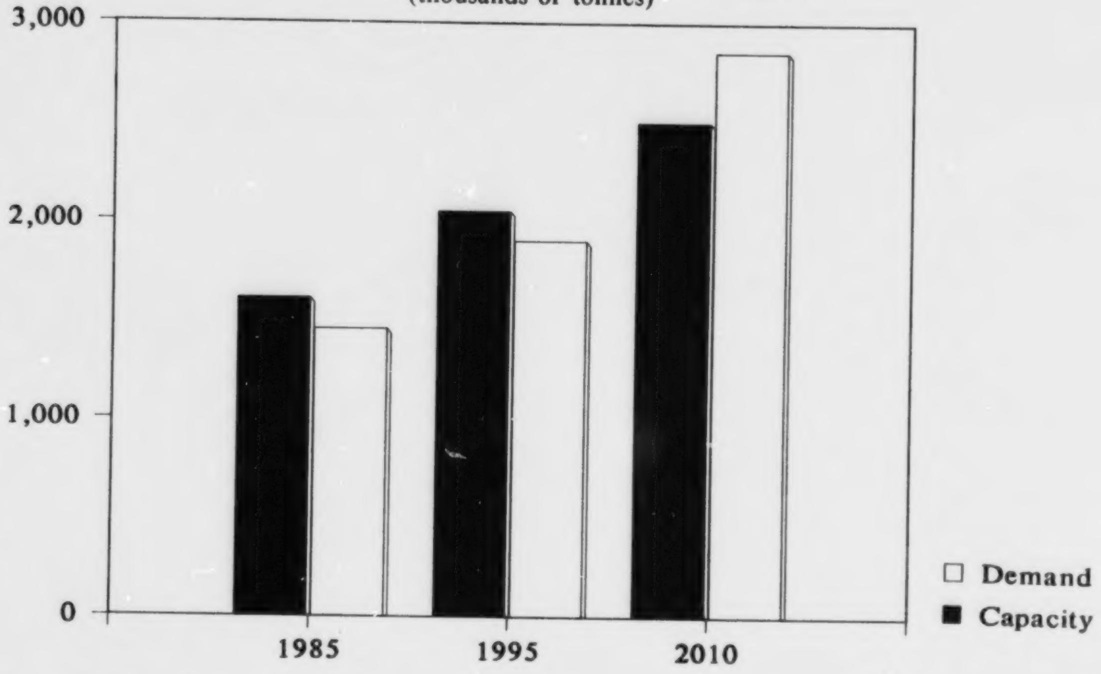
Source: WRA

BC Coast

The BC Coast region is ideally situated to service the Asia-Pacific and US West markets, but its ability to meet the anticipated demand growth will be restricted by the lack of competitively priced fibre (Figure 3-14). Put another way, the BC Coast will have other more attractive alternatives for its incremental fibre.

Newsprint producers in this region have, or are in the process of, modernizing and upgrading their machines. All the smaller, less efficient machines have been converted to other grades or retired. By 1995 the average machine capacity will be 170,000 tonnes per year, and by 2010 it will be 178,000 tonnes per year.

Figure 3-14
BC Coast Newsprint Market Demand vs Capacity
(thousands of tonnes)



Source: WRA

There is very little uncommitted fibre remaining in the region. The newsprint machine planned for Port Mellon will be fibred with BC Interior wood chips. BCFP added newsprint capacity in the BC Interior partly because they could not expand their Crofton facility due to lack of fibre. Fibre for additional newsprint capacity will have to come from existing products or fibre exports.

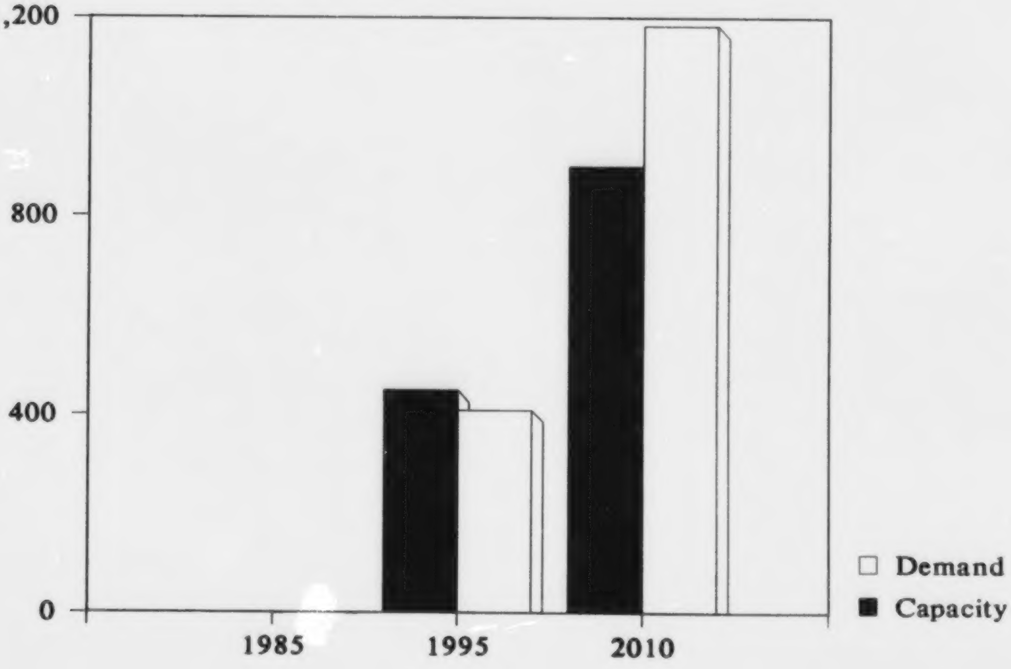
Two new newsprint machines will be added to the region between 1985 and 1995, and one machine will be completely converted to other grades. Two additional new machines (i.e., net capacity) will be added in the 1995-2010 period, but it will not be enough to satisfy the demand. Other new machines with no net capacity increase may be installed over this period if current machines become obsolete. This will be true of all regions in Canada. The following discussion will be limited to obvious rationalizations and new capacity addition.

BC Interior

This region will have its first newsprint machine installed by 1989. We anticipate a second machine will be installed before 1995 and two more between 1995 and 2010 (Figure 3-15). The growing US West and Midwest markets will ultimately demand more newsprint than this region can competitively supply and this demand will be satisfied from the Prairie Region.

Further newsprint capacity addition beyond four machines would have to involve a significant reallocation of fibre from other commodities (i.e., market BKP and dimension SPF lumber).

Figure 3-15
BC Interior Newsprint Market Demand vs Capacity
(thousands of tonnes)

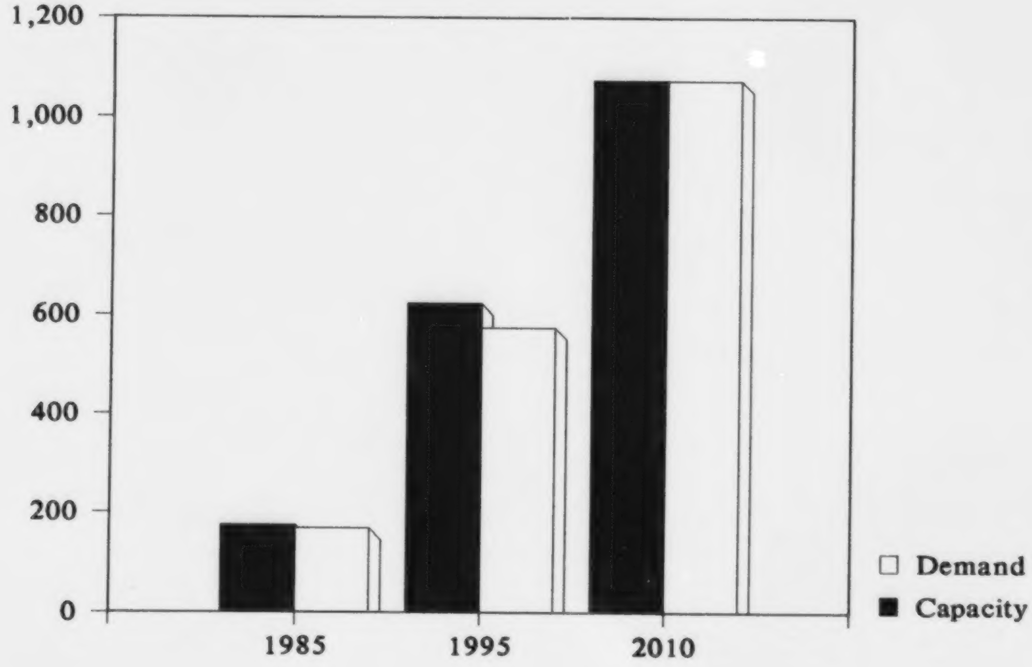


Source: WRA

Prairies

This region has two newsprint machines with a combined capacity of 175,000 tonnes per year. Fibre constraints in BC and Quebec will permit rapid newsprint capacity growth in this region. We forecast the installation of at least four new machines between 1985 and 2010, two of which will occur before 1995 (Figure 3-16). This region will supply a large portion of the incremental demand in the US Midwest and capture the major market share in the Prairies. In periods of oversupply, this region could displace tonnage from BC and Ontario, which in turn, could move to offshore markets.

Figure 3-16
Prairies Newsprint Market Demand vs Capacity
(thousands of tonnes)



Source: WRA

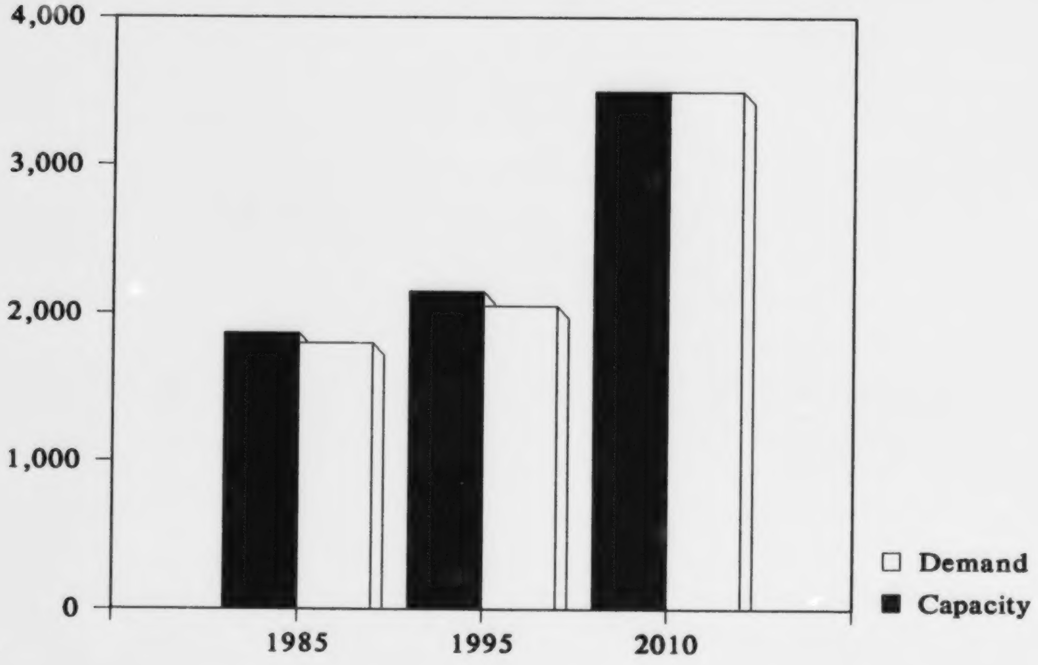
Ontario

Ontario is well situated to service the US Midwest and Eastern markets, in addition to its own needs. In 1985, Ontario had 20% of Canada's newsprint capacity, with an average machine capacity of just over 100,000 tonnes per year. Between 1985 and 1995 we forecast a net capacity increase of 280,000 tonnes per year (Figure 3-17). This will be achieved through rationalization of three older machines plus the installation of two new machines. Between 1995 and 2010, we foresee a significant capacity increase of 1.35 million tonnes and a further rationalization of older machines. We expect to see seven older machines retired and/or converted to other grades and eight new newsprint machines installed. Average machine capacities will be 126,000 tonnes per year in 1995 and 194,000 tonnes per year in 2010.

In addition to the machine upgrades and rationalizations, the Ontario industry must upgrade its newsprint pulping processes. Ontario still averages 20% high yield sulphite and 46% stone groundwood in newsprint. To become more competitive, the industry must move to the use of more TMP. Reduction of the chemical pulp will have the added advantage of "extending" the utilized fibre to produce more newsprint.

Ontario will become the leading newsprint region in Canada with respect to total capacity. Its percentage of Canadian capacity will increase from 20% in 1985, to 27% in 2010.

Figure 3-17
Ontario Newsprint Demand vs Capacity
(thousands of tonnes)



Source: WRA

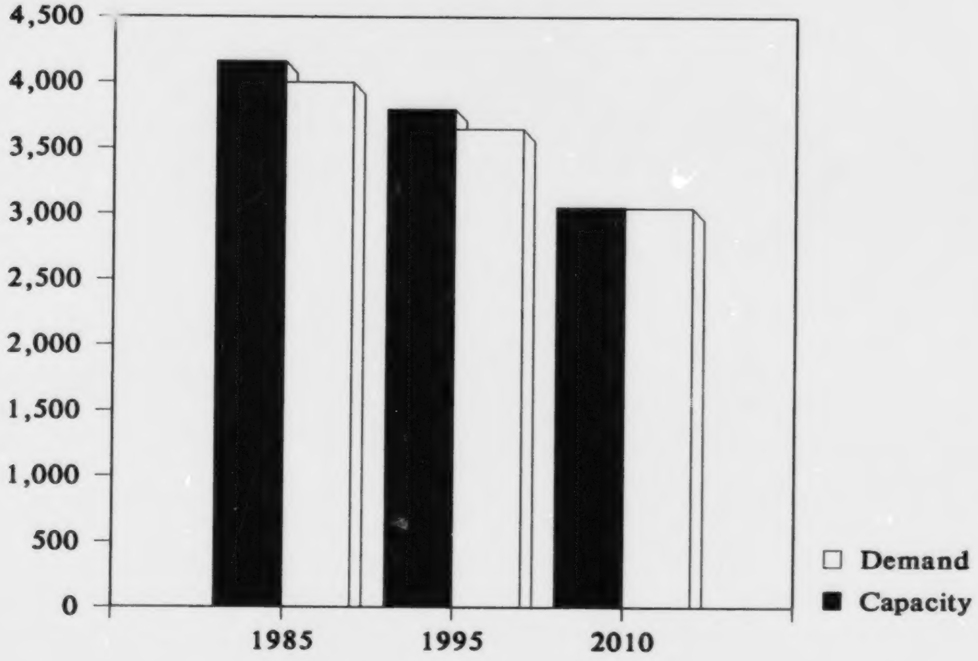
Quebec

Nowhere in Canada will there be a more dramatic change occurring than in the Quebec newsprint industry. The restructuring that we foresee for this region will be driven by a softwood fibre constraint and aging assets. In order to maximize industry profitability, significant grade shifting will occur, resulting in a net capacity reduction of 1.1 million tonnes (Figure 3-18). Average machine capacity will increase from 82,000 tonnes per year in 1985 to 179,000 tonnes per year in 2010. Between 1985 and 1995, 31 newsprint machines will be rationalized and five new machines will be installed (three of these are already operating). Between 1995 and 2010, a further eight machines will be converted or retired and no new newsprint machines are anticipated. Again, this does not include machine closures for technical obsolescence and subsequent replacement with new machines.

Newsprint demand currently satisfied from Quebec will gradually be supplied from Ontario and, to a lesser extent, by the Atlantic region. It is critical, therefore, that Ontario and Quebec coordinate their strategic planning to ensure a smooth transfer of market share.

These changes will result in a much smaller, but more competitive Quebec newsprint industry. Coupled with the changes occurring in other forest products sectors in the region, such changes will ensure that Quebec remains in the forefront of Canada's pulp and paper industry.

Figure 3-18
Quebec Newsprint Demand vs Capacity
(thousand of tonnes)



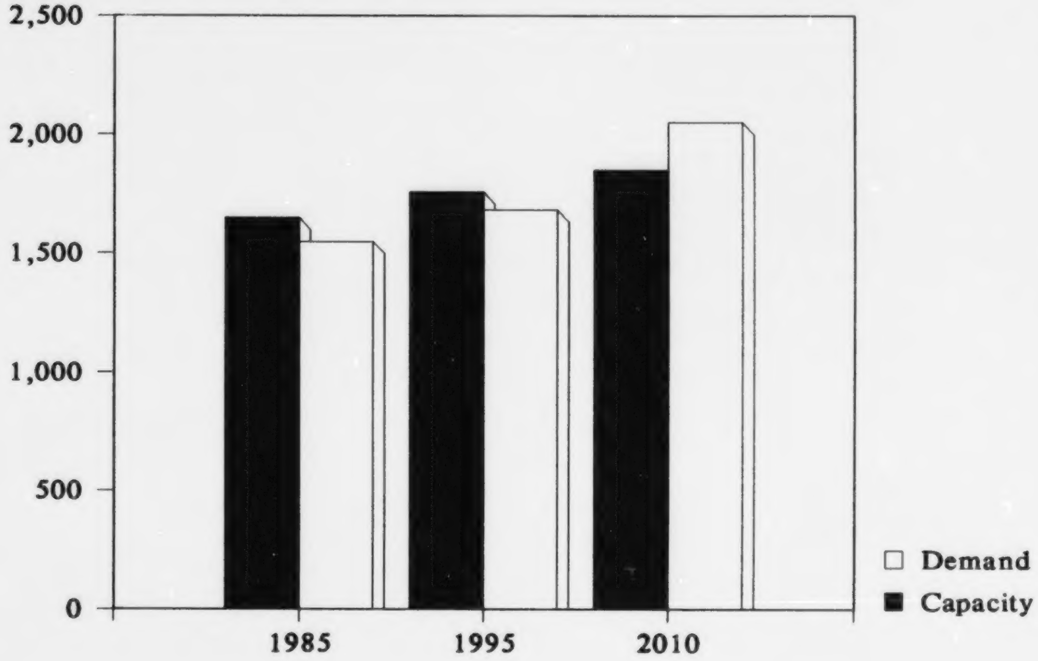
Source: WRA

Atlantic

The Atlantic region has traditionally serviced the eastern seaboard of the US, Western Europe and Latin America in addition to its own requirements. While the Eastern US continues to grow slowly, newsprint opportunities in Western Europe and Latin America are on the decline. We anticipate modest capacity increase for the region from 1.65 million tonnes, in 1985, to 1.85 million tonnes in 2010 (Figure 3-19). Between 1985 and 1995, six machines will be retired or converted to other grades and two new machines will be installed. From 1995 to 2010, a further two machines will be rationalized with one new machine installed. The average machine capacity in 1985 was 92,000 tonnes per year and in 2010 we expect it to be 142,000 tonnes per year.

This region is very close to its limit of available softwood. Like the BC Coast and Quebec, further newsprint capacity increases can only occur with the reallocation of the fibre resource. We have, therefore, shown a demand potential that exceeds supply capability from this region.

Figure 3-19
Atlantic Newsprint Demand vs Capacity
(thousands of tonnes)



Source: WRA

4

BOXBOARD

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Opportunity Overview

As a relatively small producer of commodity grade products, the Canadian boxboard industry currently faces several of the same challenges as the kraft liner industry. However, the strategic solutions for these two industries are quite different. While producers of kraft paper products are encouraged to specialize and upgrade to higher value-added grades, the primary opportunity for the boxboard industry lies in exploiting the very nature of the commodity industry. Canadian producers are in a favourable position to offer "more for less" in the North American market, thereby securing a sizeable market share.

The Canadian boxboard industry is very different from that of the US. The latter is characterized by large operations which specialize in a few grades, thereby enjoying economies of scale. Canadian mills have been encouraged to remain small, because of the sparsely populated regions they supply, and to produce a large number of different products to meet domestic requirements. Subsequently, Canadian producers cannot compete on a cost basis with their US counterparts.

Future demand growth will be strongest in bleached and unbleached boxboard grades. Liquid packaging, especially aseptic packaging, will show very strong demand growth in the medium and long term. The demand for recycled boxboard, on the other hand, is slowing down. North American demand for unbleached folding boxboard is projected to be strong over the forecast period. This segment, as will be seen however, is not perceived to be an opportunity for Canadian boxboard producers. In the US, large additions are being made to existing capacity to meet the growing demand for this product. Because the productivity gap which currently exists between the US and Canada continues to widen for both kraft and recycled grades of boxboard, little opportunity exists for Canadian production of commodity grades of unbleached kraft boxboard. Canadian producers must focus on the production of those grades which have applications in the growing sectors, and in which they can also develop a comparative advantage.

We perceive an outstanding opportunity for the Canadian boxboard industry in the production of special multi-ply grades of paperboard, which are constructed from layers of kraft and mechanical pulp. These are classified as Scandinavian triplex or duplex board. (The former refers to board with a bleached kraft top and bottom layer and a mechanical or chemimechanical pulp center layer, while the latter refers to a multi-ply board with only the top side bleached kraft.) These special grades are produced on multiformers. For folding boxboard production, the CTMP portion, which comprises 25%-40% of the total sheet weight, is bleached or unbleached high freeness grade.

By using a significant proportion of less expensive furnish (CTMP), multi-ply boxboard grades provide all the properties of more expensive SBS at a lower cost. Another advantage of CTMP is higher bulk and stiffness. Thus, producers of this type of board are often able to offer the buyer more for less.

Multi-ply grades dominate a large sector of the European boxboard industry, as a substitute for solid bleached sulphate board (SBS), yet have made few inroads in North America. Canadian-made multi-ply board could meet with considerable success in the underexploited US market. A few Canadian producers have already begun to upgrade or add capacity in order to take advantage of this opportunity. This type of entrepreneurial response will allow the Canadian boxboard industry to flourish in the future.

About Definitions of Boxboard

Boxboard is an area of conflicting definitions and uncertain, overlapping or nonexistent statistics. Interregional production technologies and applications differ widely.

For the purposes of this analysis, boxboard will be categorized as follows:

1. Folding boxboard
   a) kraft (bleached and unbleached) (SBS, SUS)
   b) kraft-mechanical (duplex and triplex)
   c) recycled (chipboard)

2. Liquid Packaging Board (LPB)
    a) kraft
        i) bleached (SBS)
        ii) unbleached - white lined and white coated
    b) kraft-mechanical

3. Food Service Grades
    a) kraft - SBS and white top kraft
    b) kraft-mechanical (triplex)

4. Graphic Board

Folding boxboard is defined here as all grades used to form 'closeable' packages, except those used for corrugated board production or for packaging of liquids. 'Food service' board grades (plate, cup and tray stock) are thus excluded (as well as graphic board, tube, can and drumstock).

The major areas of application for folding boxboard are frozen and dried food, pharmaceuticals, etc. The major grades of folding boxboard are solid bleached sulphate (SBS), chipboard, white lined coated chipboard, Scandinavian duplex and triplex, unbleached kraft board (SUS), coated unbleached kraft board and white lined kraft board.

Liquid packaging board is used to package milk, juice, soft drinks and other beverages. The aseptic packaging industry is included in this definition, and is dominated worldwide by a few major producers.

Graphic board is used primarily for advertising and book covers. It is most popular for use in annual reports, book covers, record covers, store display signs and other printing applications. It is usually constructed from SBS, or triplex board.

Size and Nature of the Market

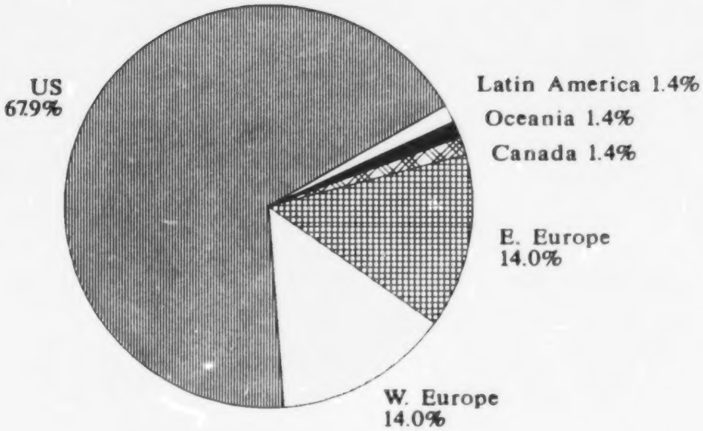
The global boxboard industry is a complex and fragmented one, and this makes it difficult to quantify precisely. There are many different types of boxboard, constructed from various furnishes, for a great number of end-uses. Several broad observations can be made about the industry, however.

As discussed previously, there are four primary categories of boxboard based on end-use: folding boxboard, liquid packaging board (LPB), food service grades and graphic board. The first is the largest grade of boxboard. Considered in its broadest sense, world capacity for folding boxboard was just under 20 million tonnes in 1986. However, this total applies to all types of furnish, including nonwood.

The FAO reports that the world capacity for pulp-based folding boxboard in 1986 was approximately 10 million tonnes (excluding waste-based pulp). The US and Western Europe are the largest producing regions. Canada accounts for about 6% of world capacity.

SBS is considered the highest-quality type of boxboard, and it has applications in all end-uses. In 1986, world capacity for this product was over seven million tonnes. Figure 4-1 shows that the US comprises the largest share (68%) of world SBS capacity, while Western Europe and Eastern Europe each account for 14%. Canada, Oceania and Latin America each have roughly 1.4% of world capacity in SBS. In 1987, Canada produced just over 100,000 tonnes of SBS.

Figure 4-1
1986 World Capacity for SBS
(percent of total)



Total 7.3 Million Tonnes

Source: FAO

As well as being the largest producer of SBS, the US is also the largest exporter. In 1986, it exported almost 500,000 tonnes of SBS; the major importing regions were as follows:

Japan	150,000 tonnes
Canada	65,000 tonnes
Australia	60,000 tonnes
South Africa	50,000 tonnes
Netherlands	25,000 tonnes
Venezuela	20,000 tonnes

Although it comprises a smaller segment of the world boxboard market, liquid packaging board has proven to be the most dynamic and interesting of all the grades. In 1985, world demand for LPB was just under 2 million tonnes. Western Europe accounted for 663,000 tonnes, and the US 631,000 tonnes; Japan consumed 186,000 tonnes. In North America and Western Europe, milk is the dominating product packed in cartons.

Both Western Europe (the Nordic producers) and the US are net exporters of LPB and, in fact, they dominate the world supply of this product. Nearly all bleached liquid packaging board is made in the US, Sweden and Finland. At present, North American producers have just over 51% of the world supply. Sweden and Finland supply about 41% of total demand and remaining producers about 8%. In 1985, Western Europe produced between 700 and 750,000 tonnes of LPB, and the US produced 900 to 950,000 tonnes.

Trends in Boxboard

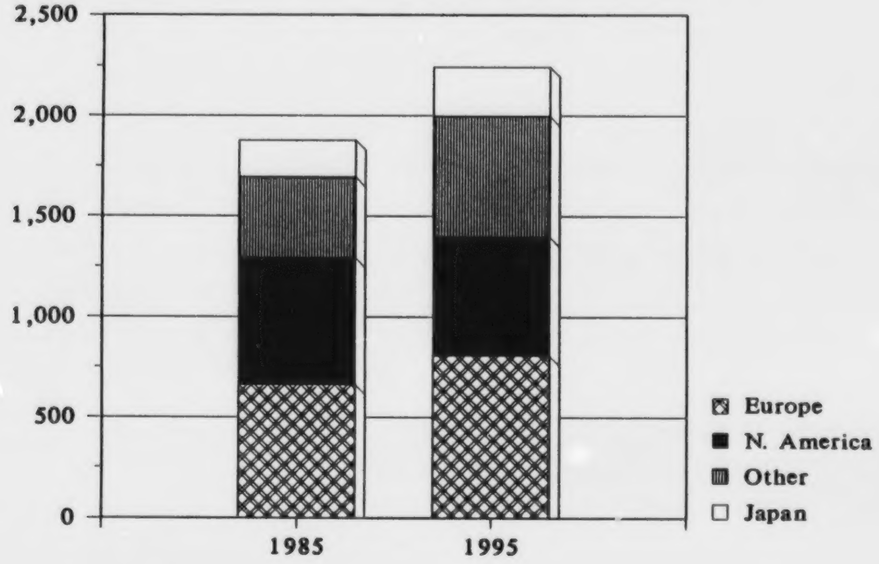
The demand for boxboard is driven by consumer demand for products which require packaging. Changing world demand patterns have had a profound impact on certain sectors of the boxboard industry.

In general terms, it can be said that world demand growth for recycled grades of boxboard has dropped, and in the US this has resulted in an absolute drop in tonnage. US producers of unbleached kraft boxboard (SUS) have begun to diversify into the folding boxboard market at the expense of recycled board.

Over the past decade, the growth in the demand for liquid packaging board accelerated in Western Europe. Several countries such as Sweden, Denmark, Germany and France consume most of their milk in cartons, as opposed to glass or plastic. There is now a European boom in aseptic packaging, as new markets develop for juice and wine packaged in aseptic cartons.

The demand for liquid packaging in the US remained relatively flat over the past decade, as demographic factors brought about a decline in the US consumption of milk and other dairy products. Therefore, the export market for SBS and liquid packaging has become increasingly important to US producers to counteract slow domestic growth.

Figure 4-2
World Demand for Liquid Packaging Board
Current and Projected
(thousands of tonnes)



Source: CIS

In Japan, the demand for liquid packaging board has grown over the past decade with half of this region's consumption supplied by the US. While the demand for milk has levelled out, there is growth potential for juices and other liquids in this market. The demand for liquid packaging in other parts of the world, such as Asia and Latin America, is projected to grow at a brisk pace - over 4% per annum to 1995. This growth will be a function of these regions' economic prosperity.

While information is scant, it is generally accepted that the US demand growth for food service board will be modest over the next decade.

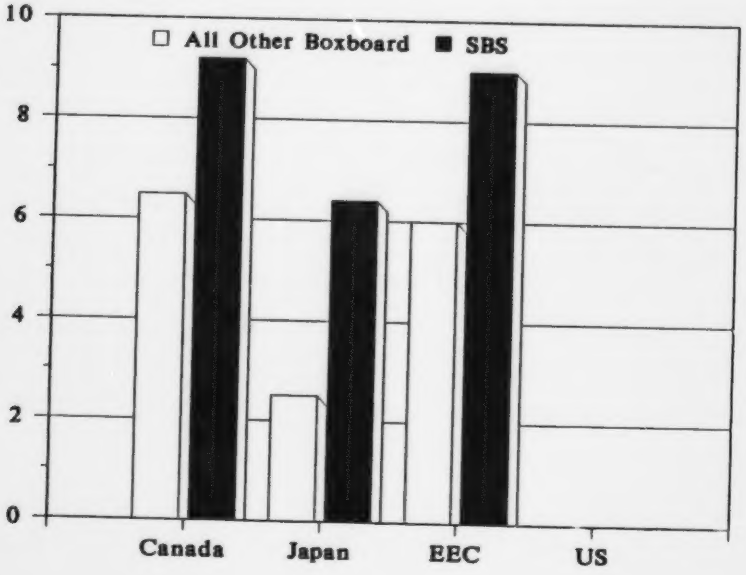
Although it is a smaller segment of the North American market, it should be observed that the demand for graphic board has shown strong growth in some end-uses in recent years. In particular, the use of two-sided coated boxboard in the production of annual reports has grown considerably in North America, and is expected to continue doing so.

A very important trend which has evolved in Western Europe is the use of multi-ply grades of boxboard in the construction of folding boxboard, LPB and food stock. Use of these multi-ply grades of board usually provides lower costs, in addition to improved bulk and stiffness, and acts as an excellent substitute for more expensive SBS. For a number of institutional reasons which will later be discussed, the use of multi-ply board has not yet become widespread in North America.

With respect to the Canadian boxboard industry, the trend has been toward the production of a wide variety of boxboard grades which has resulted in comparatively higher costs vis-a-vis the US producers. Canada accounts for five percent of the world production of boxboard, and 10 percent of North American shipments. Canadian imports of boxboard on a volume basis has slowly increased in the past decade. While Canada exports boxboard primarily to the US, it is a net importer of US boxboard.

The Canadian boxboard industry is a relatively protected one, in comparison to some of its major counterparts. Figure 4-3 illustrates this.

Figure 4-3
1987 Tariff Duties on Boxboard
(percent)

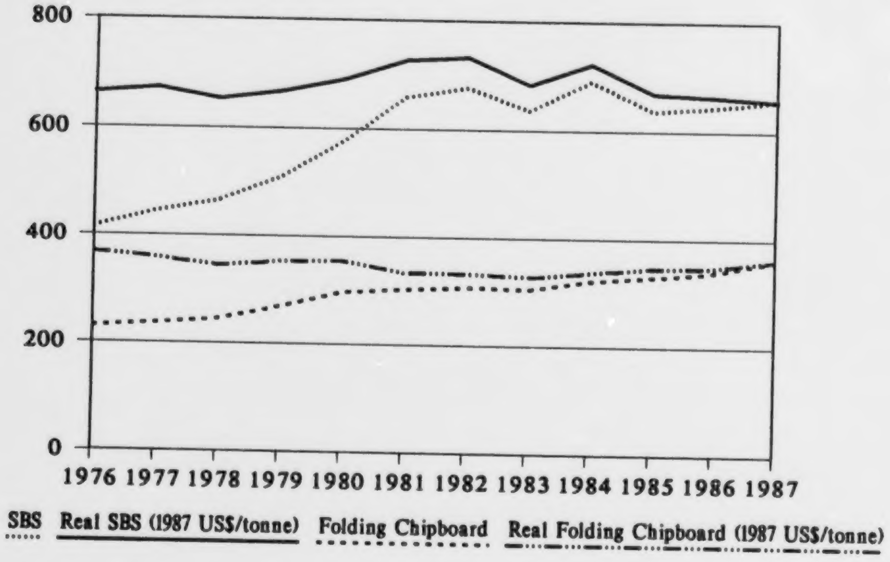


Source: Govt. of Canada

Pricing

Because the demand for boxboard varies with consumer demand, prices have historically shown moderate variation. In nominal terms, the price of boxboard has been increasing over the past decade. However, in real terms, the price of both SBS and recycled boxboard has been flat. The prices of SBS and clay-coated recycled boxboard illustrate this perfectly. (See Figure 4-4). Although a moderately constant price differential exists between the two grades, they move together in response to economic variables. The prices of recycled grades of board are sensitive to changes in the price of competitive grades, and tend to respond to the price of SBS in certain end-use markets.

Figure 4-4
SBS vs Folding Chipboard Boxboard Prices
(US$/tonne, actual and deflated 1987=100)



Source: P&P Price Book

To a certain degree, recycled boxboard is regarded as a substitute for SBS. Thus during the last recession, strong competition among folding boxboard converters made them cut costs by substituting clay-coated recycled paperboard for SBS wherever possible, saving the converters up to $180/tonne.

When wastepaper prices are low, producers of recycled board can enjoy a substantial cost differential, thereby gaining a competitive edge over producers of SBS. However, if wastepaper prices improve quickly, this edge is quickly lost.

Recessionary times are harder on SBS producers than recycled board producers. During an economic downturn, there is a decline in the demand for convenience foods such as frozen dinners (which is a major end use for SBS), and greater demand for cereal and dried goods, which are packaged with recycled board.

A problem of excess capacity has, on occasion, dampened the price of both bleached and recycled boxboard. A case in point is 1985, when a combination of excess capacity and heightened competition from overseas competitors had a harmful effect on the price of SBS and, subsequently, recycled grades of board.

Currently, the prices of all boxboard grades (and indeed most forest products) are strong. Both economic recovery, and a decrease in excess capacity, have contributed to healthier prices in recent years.

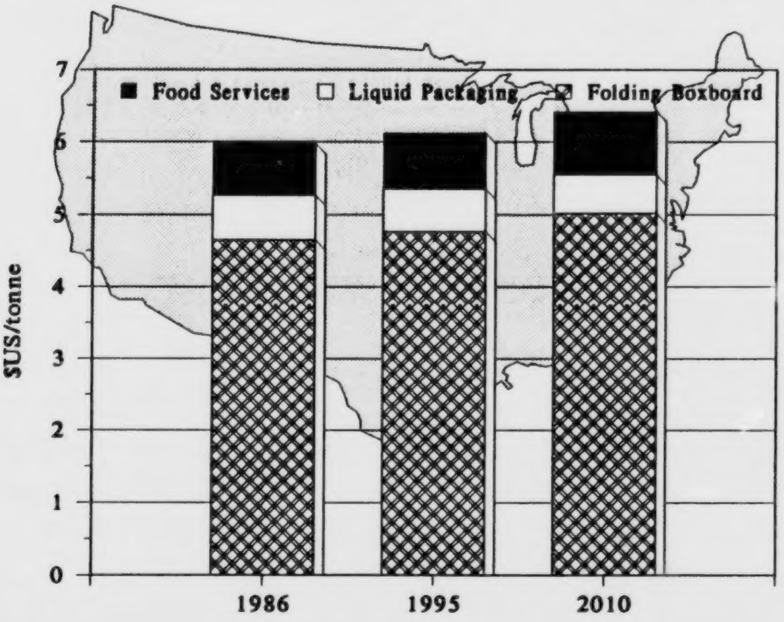
Market Analysis

United States

The US is the world's largest producer and consumer of boxboard products, and this market represents the most important strategic opportunity for the Canadian boxboard industry.

In overall terms, boxboard demand growth is expected to be unremarkable in the medium and long term. As Figure 4-5 illustrates, total US boxboard demand in 1986 was six million tonnes, and it is likely that this will grow at a slow rate to the year 2010. However, this sluggish trend does mask the fact that some grades are currently showing healthy demand growth, and that this is expected to continue.

Figure 4-5
US Consumption of Boxboard
Current and Forecasted
(millions of tonnes)



Source: CIS, WRA

In folding boxboard, the share of recycled board is shrinking, while that of SBS is expected to grow modestly. The demand for SBS is price-elastic; as the price ratio of SBS to recycled board increases, demand for the former drops. It is believed that this price ratio will remain at the current level for the next decade. The anticipated gains in SBS will be made at the expense of recycled grades in high growth areas such as pharmaceutical and other packaging, and particularly for point-of-purchase sales, where whiteness and a suitable printing surface are desirable properties.

In 1986, commercial printers in the US consumed approximately 170,000 tonnes of graphic board. Coated SBS is dominating increasingly in these applications. The annual growth rate for graphic board grades is expected to be in the 5-6% range over the next decade. It will be strongest for applications in annual reports.

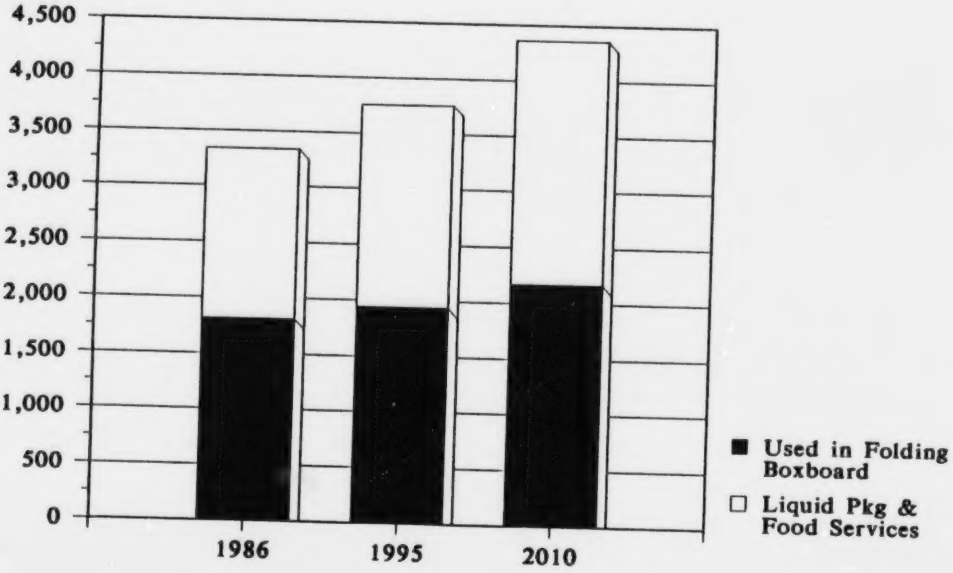
The strongest boxboard growth in the US is expected to be in solid unbleached sulfate (SUS). This product has traditionally been used in the production of beverage carrier and packaging end-uses normally held by corrugated containers, such as 24-beer cases; SUS producers have now begun diversifying into this market. Coated SUS boxboard provides higher strength properties than equivalent weight recycled and SBS boxboard, and is characterized by good printability. These properties have made SUS board a growing factor in the folding boxboard market. According to CIS, SUS held less than 5% of the folding boxboard market in the US in 1970, while today this share exceeds 16%. By 1995, the market share of SUS is expected to climb to 21%.

Although SUS is a product with considerable growth potential, it is not perceived as a strategic opportunity for Canadian producers who wish to secure a share of the US market. This market is dominated by large US producers who enjoy economies of scale, and low fibre costs. The price of SUS falls between those of SBS and recycled board; it also has some cost advantages because it is not bleached (like SBS) and it has a basis-weight advantage over equivalent recycled board. Currently Mead Corp. and Manville Corp. are the only commodity producers of SUS board, and each company claims about 50% of this market. Manville currently has a capacity of 550,000 tonnes. Mead, which currently produces 420,000 tonnes of SUS, has recently announced a new 350,000 tpy mill for a 1991 scheduled startup. This will be producing folding boxboard and beverage packaging.

The years 1986 and 1987 have been healthy ones for SBS. This product has several end uses in folding boxboard, liquid packaging and food service stock. Both exports and domestic orders accelerated with consumer spending and the depreciation of the US dollar. There was high demand for food packaging, while paperboard milk cartons revived slightly against plastic containers, and disposable food service stock held a sizeable share of the huge fast food market. Another indication of the current health of the market is that Westvaco started up a 175,000 tpy SBS machine in 1986 with no adverse effect on the price of this product.

The demand for SBS products is expected to grow at a moderately good rate of over 1% per year to the year 2010, resulting in an additional increment of almost one million tonnes (see Figure 4-6). It is expected that this demand will be more for food service stock applications, and less for liquid packaging.

Figure 4-6
US Demand for SBS
Current and Forecasted
(thousands of tonnes)



Source: CIS, WRA

In the future, the production of milk carton stock is forecast to decline slightly, while the production of food service stock and folding boxboard will increase. The most promising area of growth, however, is that of aseptic packaging, even though it is a relatively small segment of the industry today. In Europe, this market is currently dominated by a few converters (e.g. Tetra Pak), who generally buy board from Scandinavian producers. However, a few US producers, such as Westvaco, also produce aseptic packaging board for the domestic market.

It is believed that one segment (albeit small) of the aseptic packaging industry--juice containers--will experience exceptionally strong growth in the years to come. Market surveys have found that US consumers are losing interest in purchasing frozen orange juice concentrate. Sales of refrigerated orange juice have begun to exceed those of the frozen form. Although it does not require refrigeration, consumers see aseptically sealed fruit juices as a "hassle-free" substitute for the concentrate version, and sales will continue to grow. In Pulp & Paper Week (Sept. 1987), an industry source states that the US market for 250 ml brick-style aseptic packages is growing at an annual rate of 20%.

The US is the world's largest producer of liquid packaging board, producing between 900 and 950,000 tonnes in 1985. (By way of comparison, W. Europe producers produced 700 to 750,000 tonnes in the same year.) However, almost all of the US liquid packaging board is constructed from SBS made from 100% kraft pulp. For this reason, US producers are at a cost disadvantage vis-a-vis their Nordic counterparts, who have developed cheaper duplex and triplex boards which are especially suited for the Tetra Pak system. Furthermore, the Nordic boards have attained the consistent high quality required for aseptic packaging.

Up to this point, the use of mechanical pulp-filled duplex or triplex board in folding boxboard, liquid packaging and food service stock has not been adopted in the US. North American converters are only beginning to appreciate the advantage of this type of board over SBS, and certain institutional factors such as the lack of separating stock wastes, have precluded the use of mechanical-filled multi-ply grades. There is clearly a great potential for multi-ply grades in the rapidly growing liquid packaging industry, as well in replacing SBS in the folding boxboard arena.

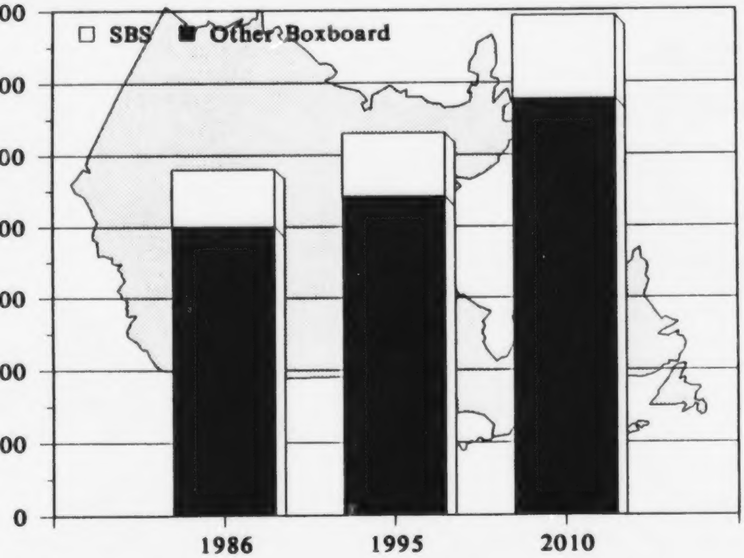
Between 1986 and 2010, it is believed that US demand for SBS will increase by over 970,000 tonnes. Over the long term, we feel that as much as 35% (340,000 tonnes) of this additional demand could be met by new capacity in multi-ply board. In Canada, this could justify at least one new machine, and the upgrading of several others.

Canada

The Canadian domestic market presents a modest opportunity for a few Canadian boxboard producers who upgrade to specialty board.

In 1986, Canada produced approximately 550,000 tonnes of boxboard. Canada consumes most of its own production of boxboard products and, historically, has been a net importer of boxboard from the US. The domestic market is small, however. In 1986, total Canadian boxboard consumption was approximately 960,000 tonnes (Figure 4-7). What little Canadian boxboard has been exported, has been directed to the US.

Figure 4-7
Canadian Consumption of Boxboard
Current and Forecasted
(thousands of tonnes)



Source: RISI, WRA

SBS accounts for almost 17% of Canadian boxboard demand. In 1986, domestic producers supplied about 100,000 tonnes of SBS, while 60,000 tonnes were imported from the US. Very small quantities of SBS were exported to the US.

Canadian demand for boxboard is expected to grow at a modest rate of between 1% and 2% per year to the year 2010. In total, an increment of 425,000 tonnes is expected between 1986 and 2010. As in the US, the demand for liquid packaging can be expected to continue slowing over the medium term. Furthermore, if the price ratio of SBS and recycled carton continues at the same level over the next decade, as predicted, the share of SBS to total boxboard will likely increase.

Based on the conservative assumption that SBS as a proportion of total boxboard demand will increase from 17% to 20% during the forecast period, an incremental SBS demand of 100,000 tonnes can be expected between now and 2010.

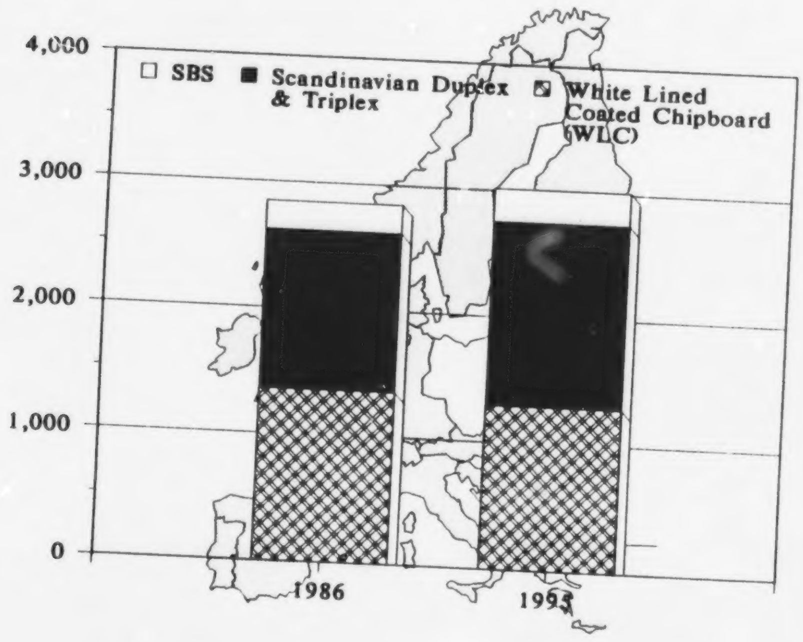
Little opportunity exists in the production of unbleached or recycled boxboard for the Canadian market in the long run. The economies of scale and homogeneity of product required to make Canadian boxboard competitive against US products have not, and will not, come about in the Canadian industry. However, a few producers who choose to upgrade to multi-ply board will be able to compete for the domestic incremental demand in SBS. As a less expensive substitute for SBS, multi-ply board can give Canadian producers an edge against US competitors in their domestic market.

Western Europe

The Western European market is not considered to be a promising opportunity for Canadian producers of boxboard. Historically, Canadian exports of boxboard have not been directed to this market for a good reason: it is almost entirely dominated by the competitive Nordic producers.

After the US, Western Europe is the largest market for boxboard products, as well as a major exporter. In 1986, European capacity for folding boxboard was 3.7 million tonnes; total production was 3.5 million tonnes, while domestic consumption was 2.9 million tonnes (Figure 4-8).

Figure 4-8
Western European Consumption of Folding Boxboard
Current and Forecasted
(thousands of tonnes)



Source: WRA

Unlike North America, Scandinavian duplex and triplex grades of board account for a large share of European consumption. (See Figure 4-8.) In 1986, for example, these multi-ply grades of board comprised 44% of total folding boxboard production. The Nordic producers have led the way in developing and perfecting the technology used in the production of these grades, and subsequently, via favourable production costs, have established firm shares in the European market.

Although it excels in the production of multi-ply boards, Western Europe also has considerable capacity in SBS. In 1986, this amounted to approximately one million tonnes.

In 1986, the major European producers of folding boxboard were the following:

Table 4-1

Largest W. European Producers of Folding Boxboard in 1986

(capacity in tonnes per year)

Product	Company Name	Capacity
SBS	Iggesund	250,000
	Enso Gutzeit	125,000
Duplex/Triplex	Stora Kopparfors	150,000
	Tako	130,000
	Aanekoski	80,000
	Djupafors	60,000
	Feldmuhle	100,000
WLC	Mayr-Meinhoff	250,000
	Feldmuhle	100,000
CUS	ASSI-Frovifors	40,000

Liquid packaging board has met with a great deal of success in the European market in the past decade, especially in the milk industry. In 1986, Western European consumption was over 650,000 tonnes (including liquid packaging board converted in Europe and exported out of Europe).

The degree of market penetration by liquid packaging board has been uneven in Western Europe. For example, the share of board used in milk cartons is almost 100% in Italy, Denmark and Sweden, where very little glass or plastic is used for liquid packaging. In Germany and France, the share of liquid packaging board is over 80%. However, the shares in Spain and the UK are 50% and 20% respectively; glass bottles are still popular in these markets.

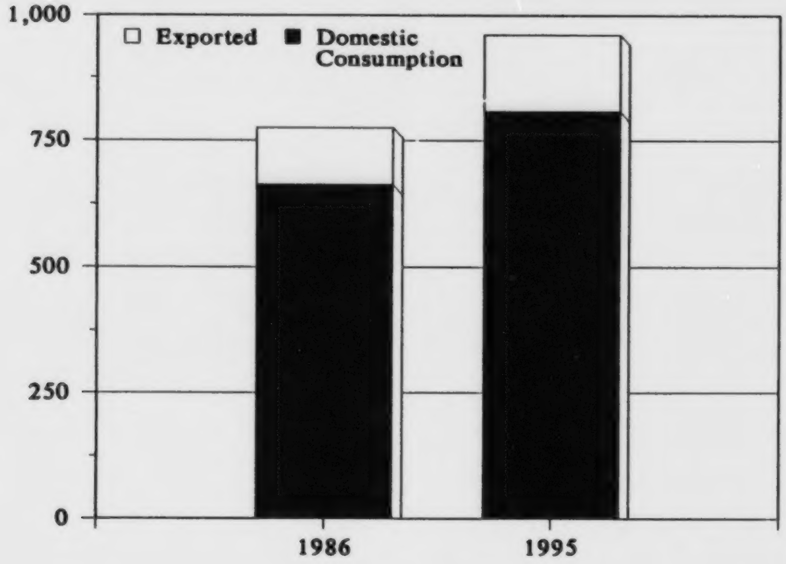
Liquid packaging boards are also widely used in the packaging of juice and wine. However, there is still considerable room for growth in these end uses in all the European regions.

As Figure 4-9 illustrates, European consumption and exports of liquid packaging board are predicted to increase. This is decidedly the main growth area in the European boxboard market. However, this market is entirely dominated by a few major converters, specifically Tetra Pak, Elopak and PKL who are supplied by Nordic producers. Over the 1985 to 1995 period, Nordic production is expected to increase at a 2.5% annual rate, and nearly all of this increase will be for shipments to Western European markets. Given the high quality of the Nordic board, and the established nature of this industry, Canadian producers can make few inroads into the European liquid packaging market.

Figure 4-9

European Supply of Liquid Packaging Board

(thousands of tonnes)



Source: CIS, WRA

Asia-Pacific

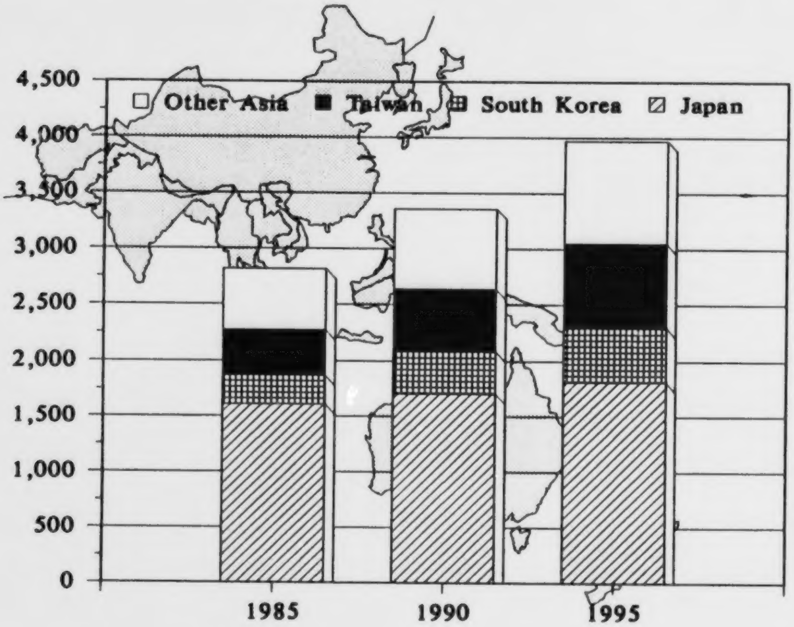
The Asian boxboard market is a highly fragmented and competitive one. Local producers supply a large proportion of the recycled board which dominates in this market, while the US is a major exporter of several types of board, including SBS. Because Canada cannot compete on a cost basis in the Asian market, any opportunity here lies in the export of board which consistently meets the specialized requirements of specific converters, such as aseptic packaging producers.

Boxboard forms a rather sizeable part of the overall paper and paperboard market in Asia. In 1985, total "other paper and paperboard" demand in Asia (excluding China) amounted to 26.2 million tonnes. Of this, just under three million tonnes, or 12%, was boxboard.

Japan, Korea and Taiwan are the largest consumers of boxboard in the Asia Pacific region, accounting for 2.3 million tonnes in 1985. Figure 4-10 shows current regional demand, as well as projections to 1990 and 1995. Demand growth is expected to be most rapid in South Korea, Taiwan and Other Asia during the forecast period. While "other Asia" accounted for 19% of total Asian demand in 1985 (excluding Oceania and China), this share is expected to increase to 23% in 1995, based on the assumption of no demand growth in the Philippines.

Approximately 90% of Asian boxboard consumption is in the form of waste-based board. Currently, Asian capacity for SBS is zero, therefore, all bleached board is imported. Japan imported 150,000 tonnes of SBS from the US in 1986, and it is estimated that in the same year the other Asian countries imported between 75,000 to 100,000 tonnes of SBS.

Figure 4-10
Asia-Pacific Boxboard Demand
Current and Forecasted
(thousands of tonnes)



Source: Hawkins Wright, WRA

In general, the strongest demand growth has been for higher quality coated board, and this trend is expected to continue. This is primarily a result of growing Asian demand for coloured printed packaging.

Liquid packaging board is also growing rapidly in the Asian market. In Japan, the demand for liquid packaging board has increased considerably over the past 10 years. Currently, this market is estimated to be approximately 210,000 tonnes, and over 50% of this is supplied by the US. While milk consumption is expected to level off in the years to come, more demand growth is anticipated for juices and other liquids.

It is estimated that 30% of the milk sold in Asia is packaged in aseptic containers. This type of packaging is expected to make large inroads into the Asian market for conventional SBS cartons, which has been traditionally supplied by the US. An increase of 60,000 tonnes in liquid packaging imports is expected between 1985 and 1990, primarily in Japan and Taiwan. (See Table 4-2).

Table 4-2
Potential Tonnage of Liquid Packaging Board in Pacific Rim Countries
(thousands of tonnes)

	Imports 1985	Increase by 1990
Japan	138	27
Korea	57	11
Singapore	20	3
Hong Kong	15	3
Taiwan	5	15
Malaysia	6	1
TOTAL	**241**	**60**

Source: Hawkins Wright, WRA

Tetra Pak has recently announced the installation of its first converting operations in China, and this market could prove to be the most promising of all the Asian regions. In the past, this country has been slow to change its consumption habits, but anticipated economic growth in China will likely change this. The demand for aseptic packaging, which is perceived as an inexpensive substitute for refrigeration, is very likely to grow in both the short and long term in China.

Japan, Korea and Indonesia are all increasing their production and exports of boxboard, primarily to other Asian countries. Hence, they can be perceived as competitors in these markets. US producers have made it evident that they, too, intend to step up their exports to the Asian countries, especially Japan. On the whole, the boxboard market in most of Asia is likely to become even more competitive and diverse than it is now.

The only obvious inroad to a share of the Asian boxboard market lies with specialty duplex or triplex grades which may give Canadian producers a cost advantage. Establishing an alliance with a liquid board producer such as Tetra Pak is the most desirable option, but the board would have to satisfy very specific standards on a consistent basis. Hence, entry into the LPB market is slow. Given these factors, entry into the Asian liquid packaging board market should be conducted on a large scale if Canadian suppliers wish to ensure buyers of a consistent, high-quality and secure supply.

Latin America

This region is not likely to be a major market opportunity for Canadian exporters of boxboard. Canada has not exported boxboard to this market in the past, and US shipments to Latin America have remained relatively static as the Scandinavians hold a significant market share.

As a developing region with a great deal of potential economic growth, Latin America is likely to increase its consumption of boxboard, in particular liquid packaging board, in the years to come. However, much of this additional demand is likely to be met by domestic suppliers (i.e., Brazil) and Nordic exporters.

If Latin American consumption of aseptically packaged beverages grows substantially, there could be an opportunity for Canadian exports of aseptic packaging in this market. It is believed that Canadian exports of multi-ply boxboard could compete with those of the Nordic suppliers.

Currently, Chile, Argentina and Brazil produce some boxboard, largely for internal use. Argentina imports some specialty board for the construction of Tetra Pak containers. Both Venezuela and Brazil also import small amounts of specialty board. Latin America presently has an SBS production capacity of 100,000 tonnes, and this is expected to increase, although not as quickly as demand.

Competitive Position

In global terms, Canada is a relatively small producer of boxboard. This sector has 12 mills, which are entirely or partially engaged in the production of this product. There are six large plants which produce between 50,000 and 125,000 tonnes per year, while the remaining mills produce less than 50,000 tonnes per annum. Canada's largest mills do not have economy of scale machines, which currently run in excess of 175,000 tonnes.

The nature of the Canadian boxboard market has prevented this industry from developing a few large production units. The comparative costs of producing boxboard are decidedly affected by economies of scale and the degree of specialization in specific products. However, small regional markets, and the necessity of providing a wide spectrum of products have not allowed Canadian producers to attain either efficiency or specialization.

At present, total Canadian capacity for boxboard is approximately 570,000 tonnes[1]. BC and the Atlantic provinces each account for about 9% of total capacity, while Ontario and Quebec each have roughly 41% of capacity. Three of the largest mills are in Ontario, and two in Quebec. Less than half of total Canadian capacity is integrated forward into box making.

Historically, Canada has been a net importer of boxboard products, and imports have been growing faster than exports. A large proportion of Canada's boxboard exports are destined for the US. In 1986, the latter accounted for over 85%, while insignificant amounts went to Europe and other countries.

Almost all of Canadian boxboard imports are from the US, and in 1986 this amounted to approximately 200,000 tonnes. As Figure 4-11 shows, Canadian imports of SBS alone exceed the total tonnage shipped to the US.

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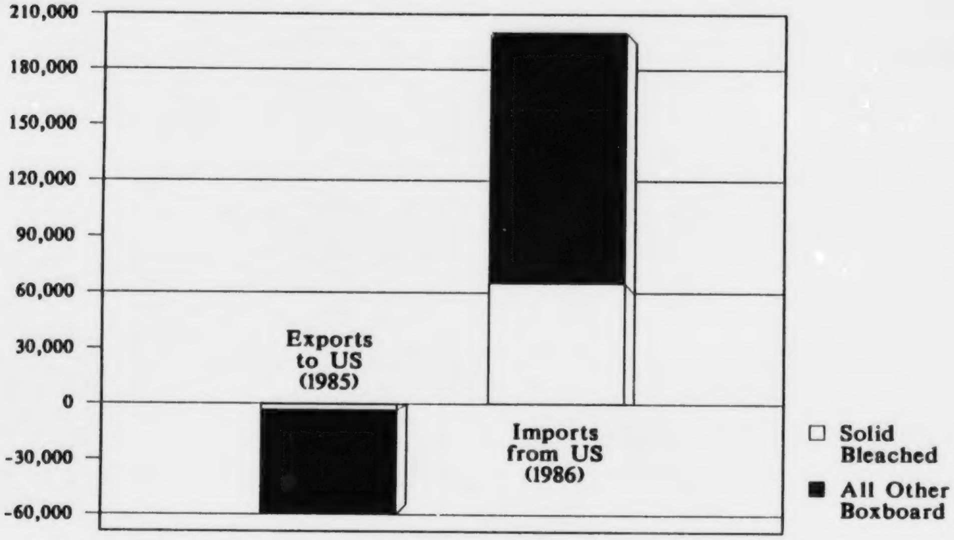
[1] It should be noted here that our estimates of capacity, based on the aforementioned end-uses, are lower than that published by the CPPA. The latter includes miscellaneous board grades in their figures which are excluded here.

Figure 4-11

Canadian Trade with the US in Boxboard

(tonnes)



Source: CPPA, Statistics Canada

National Strategy Implications

In the future, Canadian producers will be unable to make inroads into the markets for commodity boxboard grades. There are zero to very limited opportunities for Canada with regard to the following:

1. Unbleached grades of folding boxboard, including white lined and white coated, due to comparatively high costs.
2. SBS for the same reason.
3. Chipboard (recycled), including white lined, due to a shortage of raw material and subsequent higher production costs.

There is, however, a great potential for the special multi-ply grades of paperboard mentioned earlier. In Europe, these form a great proportion of the rapidly growing liquid packaging market and are also replacing SBS in the folding boxboard area. Presently, one Canadian mill is upgrading to produce this product (scheduled to come on stream in September 1988), while another has announced new capacity for 1989/1990. No other mill in North America produces these grades. By way of contrast, almost half of Western European folding boxboard is of the duplex or triplex variety.

The US is perceived as the most promising market for these multi-ply grades of board. The demand for SBS is expected to continue growing in this market, and a substantial proportion could be met by Canadian-produced multi-ply board. Certain segments of the liquid packaging market, in particular aseptic packaging, are currently booming in North America and Asia, and strong growth is anticipated for some time. As mentioned earlier, multi-ply board has applications in this industry.

In the long run, the prospect of free trade with the US could have a harmful effect on marginal Canadian producers of boxboard, particularly if the tariffs on these products are removed. While Canadian producers of commodity boxboard cannot hope to compete with the large US producers who enjoy economies of scale, they can specialize in products which fill certain market niches, or act as high-quality substitutes.
Multi-ply board is a perfect example of this.

Canadian boxboard producers will not gain from further integration of the domestic industry. Instead, they should take advantage of the commodity nature of this product, and the relative inflexibility of the US boxboard industry, to develop North American markets for their products.

In summary:

National Strategic Implications
Commodity Boxboard Grades

- limited opportunities for Canada in
    - unbleached grades of folding boxboards
    - white lined and white coated
    - solid bleached sulphate (SBS)
    - recycled chipboard, including white lined

- considerable potential for Canada in
    - multi-ply paperboards

Regional Implications

As discussed earlier, the magnitude of the market and developing demand trends in the US make it a promising market opportunity for Canadian multi-ply boards. Little or no opportunity exists for Canada in unbleached grades of folding boxboard or in SBS, because of the relatively high production costs. Canadian producers of boxboard cannot compete in the US market against the US South producers. The latter have lower fibre and transportation costs, and are generally characterized by large economy of scale machines. Furthermore, there is currently little opportunity in recycled folding boxboard, because of a constraint on raw material supply in Canada.

The following is a list of each region's boxboard industry, and estimates of existing capacity.

In summary:

Regional Implications: Growth Potential

BC:	Multi-Ply Boards and Specialties
Ontario:	Recycled Boxboard: Specialties
Quebec:	Multi-Ply Boards: Liquid Packaging Grades
Atlantic:	SBS

BC Coast

Table 4-3
Boxboard Mills - BC West Coast
(tonnes)

Mill Name and Location	Capacity	Product
Paperboard Industries, Burnaby	50,000*	folding boxboard

*uses 100% recycled furnish

Currently, BC accounts for a very small share of Canada's boxboard industry. Paperboard Industries produces both coated and uncoated folding boxboard (as well as testliner) from 100% secondary fibre, on a single machine. This machine can also be used to produce gypsum board.

A major BC producer of linerboard has recently announced that it is expanding its linerboard capacity by installing a new CMP line. This or similar configurations could be put in a position to make specialty multi-ply board in the future.

Ontario

Table 4-4

Boxboard Mills - Ontario

(tonnes)

Mill Name and Location	Capacity	Product
Domtar, Cornwall	70,000	SBS
Paperboard Industries, Toronto	115,000*	coated recycled boxboard
Strathcona Paper, Napanee	55,000*	folding and setup boxboard

* uses recycled fibre

Ontario is the largest producing region of boxboard in Canada.

All Ontario mills but Domtar use recycled fibre in their furnish. The Domtar mill is integrated to a BKP pulp mill, and produces SBS, as well as fine papers.

Because of their size, the smaller Ontario mills are not in a favourable competitive position vis-a-vis their Eastern US counterparts. Furthermore, it is believed that Canadian mills pay a higher price for recycled fibre. Both Canada and the US vie for US recycled fibre because Canada's sparse population base has precluded the generation of its own. These higher fibre costs diminish the competitiveness of Ontario (and, indeed, all Canadian) recycled boxboard in both the domestic and the US market. It should be observed, however, that more paper and board is beginning to be recycled in Canada.

Most of the boxboard in Ontario is manufactured for domestic purposes. This province exports small amounts of boxboard to the US (approximately 14,000 tonnes in 1986), and insignificant amounts to other markets.

Quebec

Table 4-5
Boxboard Mills - Quebec
(tonnes)

Mill Name and Location	Capacity	Product
Cascades, Jonquiere	50,000*	coated & uncoated multi-ply
Cascades, East Angus	30,000*	coated & uncoated boxboard
CIP, La Tuque	70,000	SBS, LPB
Consolidated Bathurst, Grand-Mere	35,000*	folding boxboard
Paperboard Industries, Montreal	30,000*	100% recycled boxboard
Papeterie, Quebec City	35,000*	100% recycled boxboard

* uses some or all recycled fibre

Quebec is the second largest producer of boxboard in Canada, next to Ontario. Cascade (Jonquiere) and CIP (La Tuque) are the largest producers in this region. CIP is integrated to a BKP mill, and produces solid bleached board, and a variety of other boxboard grades. This mill produces a substantial proportion of Quebec's liquid packaging board.

All the smaller mills use at least some recycled fibre as furnish. Like Ontario, Quebec producers of recycled boxboard are at a cost disadvantage with respect to their American counterparts, because of higher recycled fibre costs. Therefore, they cannot compete in these products in the US market and, as a result, Quebec exports very little boxboard.

Quebec boxboard producers have, however, recognized the competitive advantage which lies in the production of multi-ply grades with a mechanical layer. Cascades (Jonquiere) already produces over 40,000 tpy of multi-ply board, and Tembec (Temascing) is currently building a machine to produce similar products. This will ensure larger market shares domestically, and will likely boost Quebec exports to the US.

Atlantic

Table 4-6
Boxboard Mills - Atlantic Region
(tonnes)

Mill Name and Location	Capacity	Product
Fraser, Edmundston, NB	38,000*	coated/uncoated SBS, other
Minas Basin, Hantsport, NS	10,000*	folding boxboard

* uses some or all recycled fibre

The Atlantic boxboard industry is small, and uses both softwood and recycled fibre as furnish.

The Fraser mill in Edmundston produces three types of boxboard: SBS, double-white lined (which is partly recycled fibre), and white lined manila-back (100% recycled). Minas Basin produces several grades of carton boxboard, using some secondary fibre.

5

OTHER PAPERBOARD

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Overview

Other Paperboard is a miscellaneous product category that is loosely associated with the board group of products including: Containerboard, Linerboard, Corrugated Medium, Boxboard, Milk Carton, Food Service, and Other Paperboard. Within the Other Paperboard are three generalized segments:

1) Construction board
2) Tube, Core, Drum (TCD)
3) Other

The products that typically comprise these categories are as follows:

Construction and Other

Building paper/board
Fibreboard
Hardboard
Wall board
Gypsum Linerboard
Asphalt board
Mineral board
Automotive gaskets
Acoustical board
Asbestos board
Felt board
Roofing felt/board
Saturating board
Manila board
Chip board
Insulation board
Sheathing
Specialty board (shoe, case-fibre)
Tile
Impregnating board

Tube - Core - Drum

Core stock
Can stock
Tube stock
Drum stock

Unlike the large, commodity oriented board products (e.g. Linerboard and Corrugated Medium), the majority of "other paperboard(s)" are retail products, closely related to general economic trends. Tube stock destined for paper mills is aligned with cycles in the paper industry. Construction board, in particular, is tied to the housing markets throughout North America. Many products compete for end-use markets and market share with other packaging and construction materials, such as plastics, and with other board-type grades. Recycled fibre is a large furnish ingredient of this category.

The Canadian industry is primarily concentrated in small mills, located in close proximity to large urban centres. All regions have construction board, tube, core and drum capacity.

The US industry, like the Canadian industry, has traditionally been serviced by small independent producers located near their metropolitan areas, with most of the capacity in the east. However, large US companies like Jefferson Smurfit, during the 1970s, have begun to consolidate the industry into multi-mill organizations.

Size and Nature of the North American Market

Tube, Core, Drum (TCD) production is primarily destined for domestic markets. End uses for TCD are quite diverse, from industrial construction products to consumer products. The largest single market segment in North America is the paper industry, consuming upwards of 20% of the production. Other end uses in the TCD commercial segments are textile rolls and spools, film, foil, floor coverings, mailing/packaging and construction.

In 1987, the US market consumed 1.3 million tonnes of TCD, 1.2 million tonnes of Construction Board, and 1.4 million tonnes of "other." The Canadian market is about 10% of the US market. Consumption is expected to stabilize due to replacement by plastics and other alternative materials. Textile industry segments will continue to shrink as North American producers continue to lose market share to lower cost developing countries.

Construction board, closely correlated to residential construction activity, has risen rapidly in response to the healthy growth in the North American economies since 1983. Vigorous construction activity, residential and rebuilds, has contributed to the expansion. Due to the reliance of the construction industry, demand, from a historical viewpoint, is cyclical. With a decline in overall economic activity expected in the early 1990s, coupled with expected higher interest rates and inflation, construction (residential and commercial) activity will decelerate and consequently, reduce construction board demand.

Other board consumption should follow the general economic cycles, and, as a result, production will slow and level off into the next decade. Substitution by plastics may further erode growth potential.

The Canadian Industry

The domestic "Other Paperboard" industry is composed of 26 small mills, with upwards of 60% of capacity in Ontario and Quebec. Table 5-1 illustrates the geographic structure of the industry.

Table 5-1
Canada - Other Board Industry
(1987)

Province	Mills	Machines	Products		
			Constr.	TCD	Other
BC	2	2	*	*	*
Prairies	5	6	*	*	
Ontario	7	8	*	*	*
Quebec	11	16	*	*	*
Atlantic	1	2	*	*	*
Canada	26	34	*	*	*
Total Capacity	738,000 tpy				

The majority of the mills operate small machines, in the 25,000 tpy range, producing a range of construction and "other" material. Tracking the exact capacity for individual product categories is difficult due to the fragmented nature and variety of product lines produced on each individual machine. Accordingly, exact tonnage for TCD and "other" are dynamic numbers related to market demands.

The largest Canadian "other paperboard" machine is Canfor's 70,000 tpy machine producing construction board (hardboard). This sector's largest machines are hardboard machines using virgin and recycled fibre. These machines are primarily dedicated to the hardboard product line, unlike the small machines producing a multitude of board products, such as sheathing, felt, gasket, roofing etc.

Only two mills are located distant from major metropolis areas; Nordfibre in North Bay and MacMillan Bloedel in Sturgeon Falls, Ontario. Both mills use hardwood roundwood as their principal furnish for hardboard products.

While machines are small, this factor gives them the ability to produce grades and products for selected niches i.e., specialty product lines. Thus, the strength of the industry lies in its ability to react quickly to ever changing market demands.

Industry Ownership

The Canadian "Other Paperboard" industry, unlike the larger segments of the pulp and paper industry, is controlled by Canadian-owned firms. Two-thirds of Canada's industrial capacity is operated by the top four firms; CIP, Building Products of Canada, Domtar, and IKO, with mills throughout Canada. (Georgia-Pacific and Sonoco Ltd. are the two main American firms that have capacity in Canada.)

Economy of scale, from a marketing and management viewpoint, may well be the mark of success for the sector in the future. Corporate concentration of small mill entities could be a factor in the future, thereby allowing overall sector profitability.

Trade in "Other Paperboard"

North American trade in "Other Paperboard" is primarily concentrated in the construction board products; TCD and "other" are essentially produced and consumed in the domestic market. Inter-border trade depends on local market requirements and the ability of local capacity to meet domestic consumption. Currently, Canada is largely self-sufficient in "Other paperboard" with import/exports activity small and limited to the US. Canada is a net exporter of "Other paperboard". Construction board exports are presently in the 80,000 tonne range, with imports, primarily from the US, fluctuating with economic cycles, at a high of 65,000 tonnes. In the past 15 years, construction board exports have increased by 35%, while comparatively, imports have increased almost 200%. Most of the products in this sector are free of tariff between the US and Canada.

Mill Integration

A measure of success for this sector is the degree of pulping integration, allowing a small mill some independence from purchased pulp in tight supply markets. The majority of the mills (65%) are fully integrated, usually with grinding and/or waste paper utilization facilities. Proximity to large urban centres allows the use of waste paper thereby lowering furnish costs.

The use of recycled fibre, of course, has the potential to significantly reduce fibre costs. The increased use of domestic waste paper could produce a competitive advantage for those mills able to secure a supply of recycled fibre. Full integration and expanded waste paper usage is an emerging trend and might provide modest growth for Canada within this sector.

National Strategic Implications

The emergence of replacement products and the use of waste paper as a furnish base, will make this sector of the board market more competitive. The retail nature of the products will physically place the industry within close proximity to the major distribution centres in urban Canada.

Few strategic options exist for capacity expansion in this segment of the board industry. Incremental growth to meet general consumption growth trends, at the basic GNP growth rate, is possible in the large domestic urban areas. Real opportunities may exist in full integration, preferably to waste paper, to realize cost reductions and increased profitability. Flexibility, particularly of the small independent producers, is the key to future success on small machines to allow penetration of a multitude of small market niches. Greater corporate concentration will assist in the total scale of operations and resist erosion of Canadian markets to large American firms.

Canadian producers can maintain their market share through manufacturing cost reductions via waste paper use and focusing on machine flexibility to meet the multitude of product demands, particularly in the TCD and "other" segments. Large capacity hardboard producers, relying on a hardwood furnish to keep fibre costs low, may consider the North American market, under free trade, as an opportunity for capacity expansion.

6

TISSUE

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Introduction

Producers of tissue tend to be considerably more consumer conscious than producers of other paper and paperboard. The converting and packaging operations are usually on the same site as the paper mill. Tissue thus requires a more sophisticated business approach than that associated with the majority of other paper and paperboard grades. This coupled with transportation and distribution costs, which limit the export of tissue products, means that this sector has not played a significant role in the export earnings of Canada's pulp and paper industry.

Overview

Tissue is a consumer product which closely correlates to general population and household demographic trends, disposable income and consumer preferences. Compared to market pulp and newsprint, tissue is relatively stable from both a demand and price perspective. Consumers will always purchase tissue, and even in recessionary periods, buying patterns usually result in shifts to less costly brands from premium products. The result may be lower margins rather than decreased tonnage demand.

On a macro level, tissue falls into two broad categories: sanitary and nonsanitary. In North America, sanitary is about 98% of the total tissue output. Table 6-1 illustrates the major product groups within each category.

Table 6-1
Tissue Grade Structure

Sanitary	**Nonsanitary**
toilet tissue	wrapping
towels	waxing
napkins	twisting
wipes	fruit wrap
sanitary tissue	creped wadding
cellulose wadding	pattern tissue
miscellaneous	miscellaneous

Source: CIS, WRA

The two major market segments for tissue products are consumer and commercial/industrial (C&I). Consumer tissue is retailed to the public, while C&I is purchased by the service industry (i.e. restaurants, hotels, institutions, gas stations etc.). While C&I is quite price sensitive, the consumer segment is heavily influenced by consumer advertising which emphasizes texture and appearance characteristics.

The tissue industry in Canada is concentrated in major urban markets, based on small machines, and is dominated by relatively few producers. Regional disparities occur throughout Canada, with areas of overcapacity and other areas (i.e. Prairies) deficient in capacity.

Future capacity additions in Canada will most likely be confined to the large and growing metropolitan areas, with some growth in the areas that are now regional net importers. The strategy at existing mills would concentrate on increasing productivity and the integration or upgrading of pulping facilities for the utilization of waste paper as a substitute for virgin market pulp.

Nature of the Industry

Production of tissue papers in most countries is largely destined for their domestic marketplace. In 1986, 11.4 million tonnes of tissue was produced worldwide of which about 8% was exported. This is in sharp contrast to newsprint, where in 1986, 46% of all production was exported.[1] The bulky nature of the finished product results in the propensity to locate mills adjacent to local markets, thereby minimizing freight costs. In fact, about 75% of global tissue trade (6% of all tissue tonnage) is between various Western European countries, where national boundaries are in close proximity (Figure 6-1). Thus, only 2% of all tissue production is exported to offshore markets.

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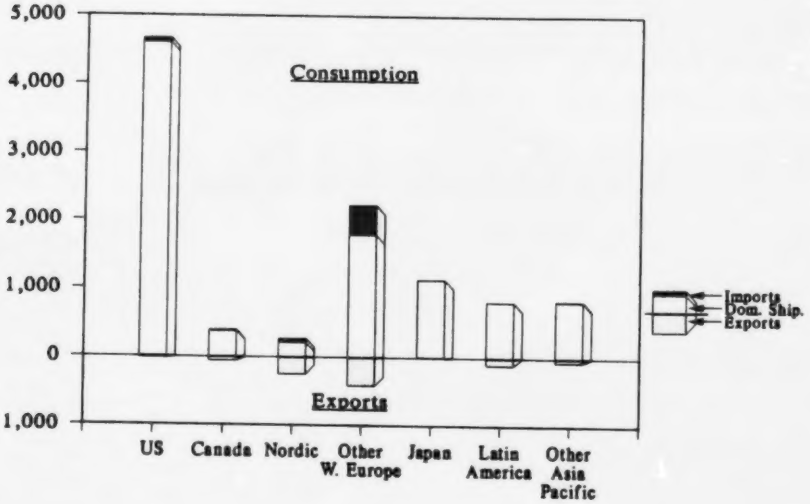
[1] Source: PPI estimates 1987

On a global basis, Canada is a small player in the tissue industry, with about 4% of reported global production in 1986 (See Figure 6-1). The primary markets for Canadian mills are the urban centres in Quebec, Ontario and British Columbia. Many of Canada's production facilities are adjacent to these major population centres. Trade is primarily with the US. Canadian exports are limited in absolute terms, amounting to about 60,000 tonnes, but still a meaningful 12% of total production.

Figure 6-1
1986 Global Tissue Production and Trade
(thousands of tonnes)



Source: PPI 8/1987

Tissue Technology

Technology in the manufacturing of tissue products is largely proprietary in nature, particularly in the converting process. Tissue machines and converting have also been in the forefront in many technological areas. The world's fastest paper machines are tissue machines, and the converting technology involves highly guarded trade secrets to protect market share in this consumer product-related paper sector. Technology has evolved to improve softness, absorbency, brightness, and cleanliness, all seen as vital success factors in today's competitive consumer products marketplace. The large American firms, such as Scott, P&G, K-C, James River and Fort Howard are the world's leaders in developing new primary tissue and converting technology. Exhaustive market research, product development and advertising provide the means to develop new product lines and capture market share.

Tissue manufacturing throughout North America and Europe is being concentrated on large, high-speed machines to capture economies of scale mainly at the expense and elimination of smaller machines. New generation machines can supply lower-cost products in the C&I grades and lower-valued consumer segments. High-priced, high-performance tissue is manufactured through low-density forming systems, resulting in reduced fibre costs. Machine size and speed vary, depending on grade requirements.

Canada's largest machines are in the 5.1 m wire width and 1525 m/min range. New machines and designs in the US and Europe are expected to top the 7.6 m wire width and 2130 m/min threshold.

Multi-layer headboxes that yield a better formation, higher tensile ratios and a higher consistency is a processing trend that is gaining acceptance throughout Europe. Multi-layering is used to increase production economy and improve the product's performance and appearance. This allows sheet bulk to increase, yielding cost reductions and improved softness. Use of alternative raw material (i.e waste paper) is improved with a multi-layering machine. Drying technology, such as thru-drying to increase bulk in premium products (i.e. facial and toilet tissue, nonwovens), has allowed industry participants to obtain a technological lead at the initial introduction of their brands.

Furnish Composition

The furnish composition of tissue depends on the market end-use. For productivity with today's high-speed machines, strength and formation are important qualities of the furnish mix. Strength is best supplied by kraft pulp, while sulphite pulp provides the softest sheet. Good adhesion and coating properties are best attained with kraft fibres, while bulk and absorbency are achieved with a mechanical furnish, i.e. CTMP.

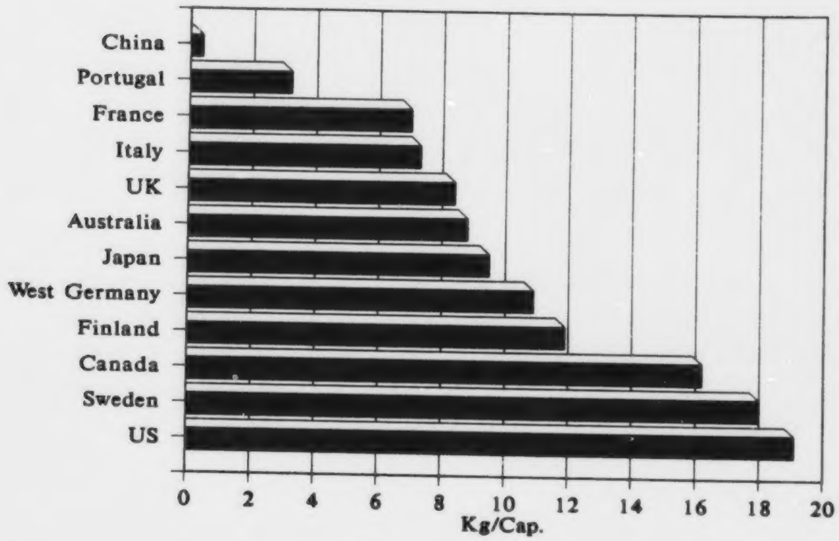
Recycled fibre makes an important contribution to the furnish mix of tissue and to the profitability of individual mills through decreased fibre costs. Products aimed at the low end of the consumer market (wiper stock) and the industrial market use wastepaper as a primary furnish. Fort Howard in the U.S., undoubtably the industry leader in C&I tissue, uses virtually all secondary fibre.

Analysis of Markets

Global Overview

The global tissue industry is based on per capita consumption trends. The US is the world's highest per capita consumer, using twice as much tissue as most Western European countries, a market with roughly the same population base. Figure 6-2 illustrates selected per capita consumption figures.

Figure 6-2
Selected Countries Tissue Consumption
(kg per capita)



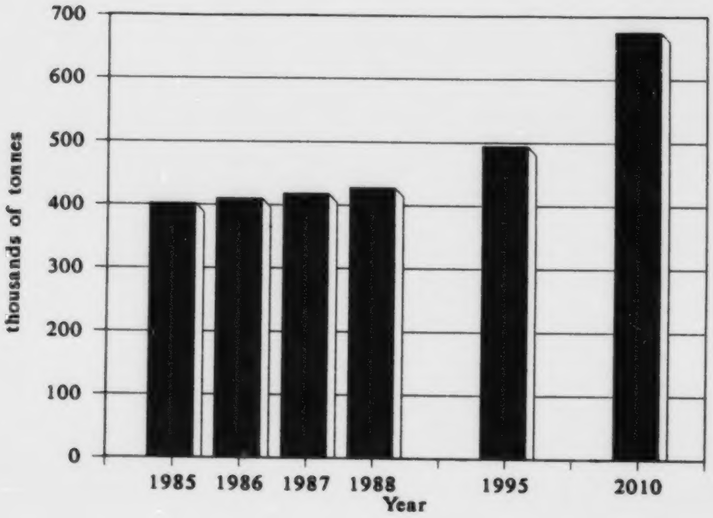
Source: PPI, WRA Estimates

Canada

Canada ranks third in the world in average consumption per capita, behind the US and Sweden. Apparent consumption in 1987 was 408,000 tonnes, a 1.5% drop from 1986 figures. This was a function of inventory fluctuations rather than demand, however, which grew by a rather normal 1.8% in 1987. Canadian capacity is currently rated at 500,000 tonnes and operated at 93% in 1987. Traditionally, trade has been minimal and primarily with the US. Exports to the US are about 60,000 tonnes, or 12% of production. Product bulk discourages overseas exports.

Apparent consumption in the short term is expected to increase at a 5.5% level in 1988, reflecting a reversal of the inventory depletion that occurred in 1987, and then normalize to the 2% level into the first half of the 1990s (See Figure 6-3). In the longer term, at a conservative 2% growth rate, consumption should grow to about 675,000 tonnes by 2010. This is an increase in demand of more than 250,000 tonnes over current consumption and 175,000 tonnes more than current capacity. This latter assumes that Canada's net export position does not erode.

Figure 6-3
Canada - Tissue Consumption
(thousands of tonnes)



Source: RISI, WRA

New investment will be warranted to supply this growing consumption in Canada. Replacement of capacity by the withdrawal of small, older machines with new units is expected to be a continuing growth strategy within the industry.

At present, two expansions have been announced for Canada: Atlantic Packaging-Whitby, Ontario, a 35,000 tpy greenfield mill; and Irving Tissue -St. John, New Brunswick, a new 60,000 tpy paper machine. The Whitby mill will service the expanding southern Ontario market, while the Irving mill will undoubtedly market to the US in addition to the limited domestic market in the Maritimes. Scott Paper in Crabtree, Quebec has also announced plans to expand their four machine facility to service the Montreal-Quebec City market. A smaller capacity expansion, 9,000 tonnes, has also been announced recently for Vancouver, BC by Vicell Canada. This operation will use dry form technology to produce specialized nonwoven products with a US export orientation.

With these various expansion plans, there is very little room for major expansion in the established producing regions in the short term. The Prairies have no capacity, however, and might support new investment.

United States

The US is the world's largest producer and consumer of tissue products. Capacity has been steadily increasing since 1971 to the present 5,250,000 tonnes. Production in 1987 set new records by increasing almost 5% over 1986, following growth in the previous year of just over 3%. Tissue's more normal growth in the past 10 years has been in the 2-3% range per year. The increase can be principally tied to the strong economic growth since the 1982 recession.

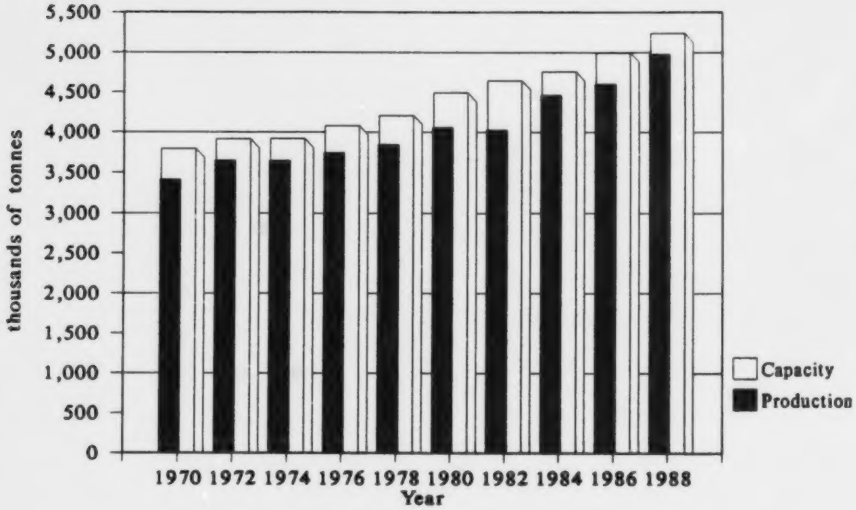
Growth in 1988 to 1990 should slow to an average of just under 2% per year. The possibility of a recession in the early 1990s should bring about this slowdown. However, tissue consumption per household is still increasing and has doubled since 1960 to the current 53 kg per household. The onset of new products (i.e. paper towels and disposable diapers) perpetuated large increases in per capita consumption.

Considerable modernization of facilities in the US has occurred over the past two decades. A total of 79 tissue machines with a capacity of 730,000 tonnes have been removed from production since 1970. Capacity increases have been through the addition of large machines at the expense of these smaller, older machines. Economy of scale to reduce costs and increase efficiency has been the driving force.

Very little new capacity is expected to enter the consumer products segment of the market in the near term, up to 1990. Growth is expected to come onstream in the C&I segment, however, with seven new large machines from now to 1990. The new machines will have an average capacity of 67,000 tonnes, ranging from 32,000 to 80,000 tonnes tissue machines. There is also a trend towards establishing large new machines with waste paper as a furnish base. Some of these new machines will be installed in the Northern U.S., which could put pressure on the Canadian tissue mills.

Figure 6-4 illustrates historical US capacity and production.

Figure 6-4
US Tissue Capacity and Production
(thousands of tonnes)



Source: WRA Data Base

Overcapacity could be a concern of the industry in the short term as demographics in the US indicate a declining trend. Profitability may suffer as these mills strive to generate cash flow at a time when consumer preference could switch to cheaper brands.

The structure of the US industry is oligopolistic in nature. The top five companies control 75% of the industry and are continually battling for market share through technology-driven product improvements and innovative marketing campaigns. Product lines are offered from most of the top 10 throughout the spectrum of end-uses, although Fort Howard has historically catered to the C&I market where it enjoys some 30% of the market. Segmentation is severe in the consumer markets where firms specialize in facial and personal sanitary products (i.e. K-C, Scott and P&G). The major companies and their brand labels control upwards of 80% of retail sales, while the other 20% represents "private label" or "generic" brands. The following table illustrates the current top 10 producers in the US, who control over 93% of industry capacity. (See Table 6-2).

Table 6-2
Top Ten US Producers
1987
(thousand tpy)

		Capacity	Market Share (%)
1.	Scott Paper	940	18.3
2.	James River	916	17.9
3.	Proctor & Gamble	816	15.9
4.	Fort Howard	771	15.0
5.	Georgia-Pacific	490	9.6
6.	Kimberly-Clark	393	7.7
7.	Erving Paper Mills	136	2.7
8.	Pope & Talbot	134	2.6
9.	Chesapeake	100	1.9
10.	APL	86	1.7
		---	----
	Total	**4782**	**93.3**

Source: API

These companies are also the world's leaders in tissue paper machine technology, converting technology and innovative marketing.

American tissue industry market shares have remained very stable in the past eight years. Table 6-3 illustrates estimated capacity for the top 15 companies in 1980. The top 10 controlled 90% of the industry and the top six players are identical to today's corporate conglomerate leaders.

Table 6-3
Top Fifteen US Producers
1980
(thousand tpy)

		Capacity	Market Share (%)
1.	Scott Paper	985	18.3
2.	Proctor & Gamble	816	17.9
3.	Fort Howard	503	10.9
4.	Georgia-Pacific	453	9.9
5.	American Can	408	8.9
6.	Kimberly-Clark	354	7.7
7.	Crown Zellerbach	281	6.2
8.	Marcal Paper Mills	105	2.3
9.	Potlatch	96	2.1
10.	Diamond Int.	90	2.0
11.	APL	82	1.8
12.	Pope & Talbot	73	1.6
13.	Erving Paper Mills	63	1.4
14.	Statler Tissue	48	1.1
15.	Nitec Paper	48	1.1
		---	----
	Total	**4405**	**95.5**
	Top 10	**4091**	**89.5**

Source: API

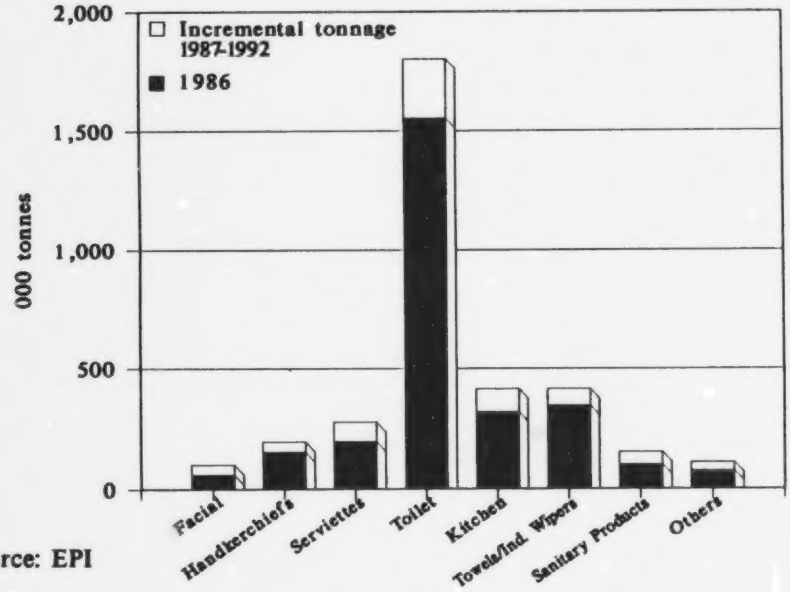
Crown Zellerbach and American Can have been purchased by James River in recent years. The top 10 producers have increased their market share by 3.8% in the 1980s, with a resultant tonnage increase of 691 tonnes (17%), mostly due to greater corporate concentration.

Long-term consumption and capacity growth to 2010 will be at a slower rate than the previous 15 years. At the 1.9% annual average growth rate, an additional 2.8 million tonnes will be required by 2010. New additions already slated in the near term, 1988 to 1990, of 500,000 tonnes will accommodate some of this growth. Conservatively, the industry could support additional capacity of up to two million tonnes. Given that technological improvements could provide new machines in the order of 90,000 to 100,000 tonnes, the US market could support at least 20 new tissue machines. However, specialization in the profitable consumer markets will allow companies to build smaller machines to attack market niches. Thus, the 20 machine estimate could be conservative.

Western Europe

The second largest market for tissue is Western Europe which has an average consumption of 8.1 kg per capita. Per capita consumption varies throughout the region, from Sweden's high of 18.0 kg, to Portugal's low of 3.2 kg, due to differing consumer habits (Figure 6-5). West Germany, France, Italy and the U.K. account for nearly 70% of total consumption. Overcapacity is the major short-term problem for the industry. Installed capacity is about 3.4 million tonnes (1986), with consumption of about 2.9 million tonnes.

Figure 6-5
Tissue Consumption in Western Europe
Per Product 1986 - 1992
(thousands of tonnes)



Source: EPI

Consumption growth in Europe, over the next 2-3 years, is expected to follow the excellent economic growth of the past five years, but slow down in the early 1990s. The result may mean a lessening of export trade and a consolidation of domestic segments. At present, 480,000 tonnes, or 25%, of all European tissue is exported between countries throughout the Western European region. Sweden and Finland are the major export players accounting for about 50% of the total; France, Denmark, West Germany, Belgium, Italy and the UK import 65% of the exports. This is the largest cross-border movement of tissue in the world.

The overcapacity situation is driving a restructuring of the industry, with a consolidation of the mills into the hands of the large global companies. Foremost is Scott Paper International, with 25% of the EEC market. Future growth by Scott is expected in the EEC through capacity expansion in Belgium and France, and acquisitions in the UK and Spain. James River, Kimberly-Clark and Fort Howard are other American-owned companies moving into the European market through joint ventures and mill acquisitions. Sweden has consolidated some of its tissue industry through the acquisition of MoDo's tissue group by Holmen. Small industrial concerns are expected to survive but in smaller market niches, catering to selected geographic segments or end-use markets. The end result is an oligopoly of tissue producers similar to that in the US.

Individual countries are demonstrating growth rates faster than the basic economic growth rate of 2.0%. Portugal and Spain will experience greater growth than other EEC members, at rates double the economic growth. Collectively, Western Europe will achieve growth at the same rate as the US market, 1.9 - 2.0% in the long term to 2010. This translates into consumption of 4.6 million tonnes. This is a 1.7 million tonne increase, requiring 15-20 new machines to satisfy market demand. In the short term, increased consumption will be primarily in the sanitary segment of toilet tissue. Other tissue segments should experience small incremental growth.

Asia-Pacific

Japan is the largest producer and consumer of tissue in the Asia-Pacific market, accounting for over 50% of the total. Japan's production and consumption has doubled in the past 10 years to reach 1,150,000 tonnes in 1986. Facial and toilet tissue have been the major growth sectors. Tissue's bulk results in very little intraregional trade activity, other than between Japan and China. This is not expected to change, which means that this market represents little or no opportunity for Canadian exporters.

Other countries, while starting from a smaller base, are also experiencing rapid growth. Taiwan will experience a 60% rise from 1986 production levels through domestic firms increasing, and the start-up of a new mill by Scott. South Korea's industry has grown 21% in the past few years primarily to fuel the increased demand for facial and toilet tissue. Other countries will continue to expand, albeit at slower rates, to meet domestic demand. Imports account for less than 2% of all production and should continue to remain a minor factor.

Competitive Position

Canadian Industry Structure

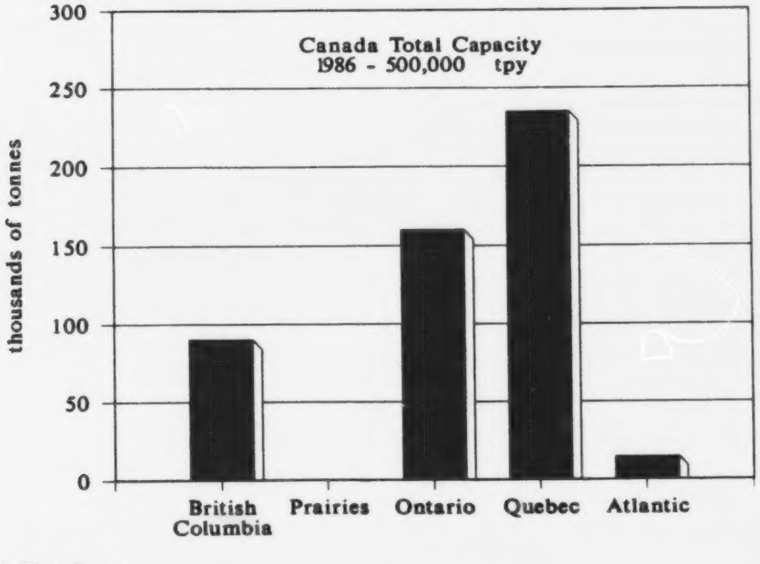
The domestic tissue industry is primarily concentrated in Canada's three major urban centres: Southern Ontario, Montreal-Quebec City, and Vancouver. Eighty-five percent of the industry's mills and 75% of its capacity is in Canada's eastern industrial heartland and population centres. Table 6-4 and Figure 6-6 illustrate the geographic structure of the industry.

Table 6-4
Canada - Tissue Industry

Province	Mills	Machines	Average Size Paper machine (thousands of tonnes production per year)
B.C.	1	4	23
Ontario	4	7	23
Quebec	8	14	17
Maritimes	1	1	15
Canada	14	26	19

Source: WRA Database

Figure 6-6
Canada - Tissue Capacity by Region



Source: WRA Database

Canada's tissue industry is dominated by American controlling interests; fully 44% of capacity is controlled Scott Paper and Kimberly-Clark, with eight machines and three machines respectively. Scott is by far the dominant industry producer with 33% of total capacity, Dominion Cellulose is a distant second with 16%. E.B. Eddy and Kimberly-Clark, with 15% and 12% respectively, constitute the other major players. Collectively, these four companies control 80% of the total domestic tissue industry.

Integration status is a major factor in the profitability of the industry. At present, only 50% of the 14 mills are fully or partially integrated, with either groundwood or wastepaper/recycled operations on site; four mills have virgin pulp integration. Nonintegrated mills dependent on purchased fibre can reach a low level of profitability in buoyant pulp markets. With pulp prices expected to remain high until the early 1990s, the short-term outlook for nonintegrated mills may be discouraging. However, the majority of Canada's nonintegrated mills are divisions of larger pulp and paper companies and can receive affiliated pulp supply, i.e. E.B. Eddy, Dominion Cellulose, Scott, Kimberly-Clark and Proctor and Gamble. The prospects for affiliated mills are undoubtedly much greater than the stand-alone nonintegrated mills, e.g. Scott, P&G., K-C have the ability to supply all their own pulp if necessary.

A measure of competitiveness of this sector is the age of installed capacity. Typically, of course, new tissue machines are large and efficient. Canada's largest tissue machines, in the 30,000 to 40,000 tonne range (four machines), are modest in scale compared to some of the new high-output machines running and planned for in the US. Four machines in Canada are post-1980 and are among the largest in Canada. Cascade has a new sanitary machine for the industrial market, while Scott, Dominion Cellulose and Atlantic Packaging with one new machine each, are aimed at the commercial market. Nearly 80% of the industry, however, is operating on pre-1980 machines, with the majority of them built in the early 1960s.

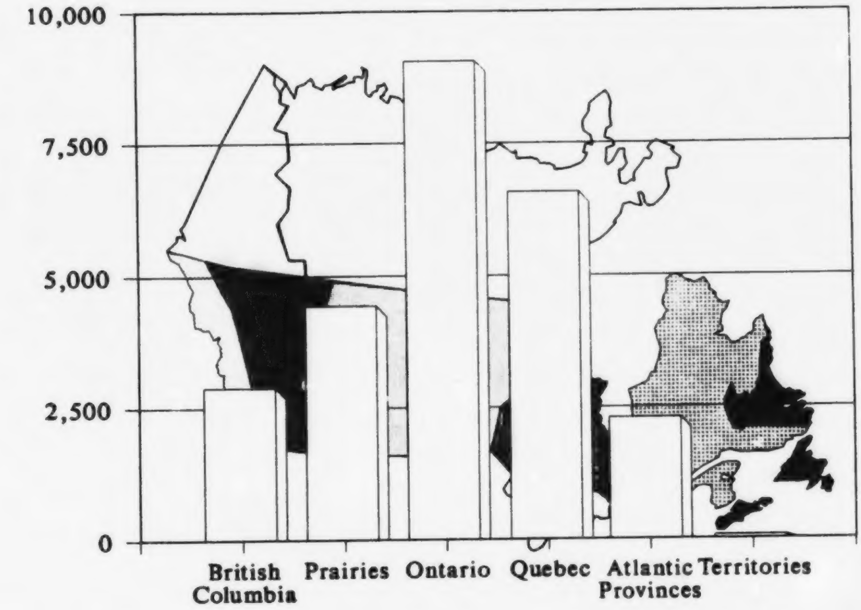
Average tissue paper machine capacity in Canada is 19,000 tpy. In the US, large-scale paper machines in the 80,000 to 100,000 tpy class are operating or planned for at the major companies. Two small K-C machines in Kapuskasing Ontario, totalling 30,000 tonnes of capacity, were permanently retired in the 1983 due to difficulties in achieving profitability with small machines at a mill far removed from the large southern urban markets. Scott Paper also has a small idled machine at its Crabtree, Quebec facility.

Canada's tissue industry is also still protected by a fairly high US to Canada import duty of 6.5%--the same as some printing and writing papers. Free trade legislation will result in a more competitive marketplace with the possibility of some American mills, with their economy of scale machines, overcoming transportation barriers and exporting into Canada. At present, only 0.3% (15,000 tonnes) of US production is exported to Canada. There is also a tariff of 3.4% between Canada and the US that will change with the trade pact and possibly open US markets to Canadian mills. There will likely be increased North-South trade within the bounds of freight and economy of scale.

Regional Implications

The tissue industry in Canada is tied to population demographics for capacity decisions. Figure 6-7 illustrates Canada's population distribution.

Figure 6-7
Canada's Population Distribution
(thousands - 1985)



Source: Statscan

British Columbia

The BC market is served by the Scott Paper complex in New Westminster, with a capacity of 90,000 tonnes. This translates into 31 kg per capita capacity in BC, a figure almost twice the national average. Overcapacity may be a problem in BC that will discourage future expansion in the province. The latest machine was installed in 1984, and is Canada's newest tissue machine. However, one machine is 1930 vintage, and another was installed in 1947. There could be justification to replace these slow, older machines with a new faster machine. Utilization of the old machines for specialized niches could enable the machines to remain competitive. Major greenfield opportunities do not appear likely in BC within the development scenario.

An example of how smaller, more specialized operations could thrive is provided by the recently announced 9,000 tonne nonwovens tissue mill in Vancouver, by Vicell Canada Tissue Ltd. The $18 million facility is targeted for sanitary products in the C&I segment, with a majority of the output destined for the export market.

Prairies

The Prairie provinces constitute 18% of Canada's population and yet, there is no installed tissue capacity in the region. All tissue must be imported from BC, Ontario, or the US. At the current average Canadian tissue consumption rate of 16.2 kg per capita, the region should be able to support an industrial capacity of 80,000 tonnes. With a conservative growth rate of 2%, up to the year 2010, the region should consume upwards of 125,000 tonnes.

The regional implications of this lack of capacity, exemplifies a window of opportunity for greenfield tissue machines. At least two, and possibly three machines, could be built in the large urban regions, Edmonton-Calgary and Winnipeg, to meet local demand.

The underutilization of the region's forests, regional expansions in BKP market pulp capacity and CTMP market greenfield capacity, support tissue expansion by providing a local cost-effective fibre source. This is the area in Canada that appears to provide the greatest opportunities for greenfield nonintegrated tissue capacity.

Ontario

Ontario supports a relatively strong tissue industry, with the majority of the machines being post-1970. Two new machines were added to the province's capacity in 1981 and 1983, at 30,000 and 20,000 tonnes respectively, with another 35,000 tonne machine slated for 1989. Currently, there are two idled machines in Kapuskasing, quite distant from the urban markets. Transportation costs will undoubtedly keep these machines in their mothball status for the long term.

At present, 160,000 tonnes of installed capacity is serving a market of nine million people. The per capita capacity, based on these figures, is 17.6 kg, a figure representative of the national average. By the year 2010, consumption growth could reach the 250,000 level, requiring one very large or two moderately sized machines to boost capacity.

The planned expansion in Whitby will cover 50% of this growth, leaving room for one new machine or mill if Quebec cannot service the demand. The Whitby mill will be based on waste paper, collected from Canada's largest urban population centre.

The greatest potential for future tissue expansions in Ontario lies in economizing on production by using waste paper furnishes in fully integrated facilities. Three mills are nonintegrated, but they purchase affiliated pulp.

Quebec

Quebec's tissue industry has installed capacity of 237,000 tonnes serving a population of 6.5 million. On a per capita capacity basis, this represents an overcapacity situation or 36 kg per capita. However, the industry also supplies tissue to the Atlantic provinces, but their demand is not great enough to utilize the full capacity. This has curtailed capacity expansion for the short term, and will keep operating rates low. There is also one idled tissue machine in the Montreal region. Long-term growth will be in increased operating rates as consumption slowly approaches capacity. Quebec, however, is a relatively slower growing region and therefore growth in local demand will be moderate.

Similar to Ontario, capacity growth into fully integrated facilities based on waste paper is the most optimistic development. Three mills are nonintegrated, but two purchase affiliated pulp. Increased profitability through increased rates and full integration is the most likely, long-term scenario for Quebec's industry.

Atlantic Provinces

Installed capacity of 15,000 tonnes is limited to one machine in St. John, New Brunswick purchasing affiliated pulp. This mill, recently purchased from K-C by Irving, has resulted in a further concentration of the New Brunswick pulp and paper industry. Construction is underway for the 1989 start-up of a new 60,000 tonne machine, which will be the largest machine in Canada. Output is slated for the domestic and export markets in the US.

Imports from Quebec assist in meeting domestic demand throughout the region, but with the installation of the new machine, domestic overcapacity will prevail. Additional growth in capacity is not expected in the development scenario.

Summary

Tissue products have tended to be much more regional in scope with respect to sales and marketing than virtually any other paper and paperboard product. Canada's pulp and paper industry has grown through the export of products, such as newsprint and BKP; its major opportunities for growth are going to remain with products that have a significant export potential.

At present, Canada has a net 45,000 tpy export to the US. Free trade, plus the installation of increasingly larger tissue machines in the US, will put pressure on Canada to keep its net export position. If Canada were to lose its net export position but remain self-sufficient, production growth would be less than 1%/year to 1995. The most realistic long-term target is for Canada to have a zero net export/import position. This would result in a volume growth to 2010 which would represent, for example, only about 2/3 that of an economy of scale newsprint machine. While this has little impact in terms of fibre demand, it has more significance in terms of value-added and Canada should take a strong defensive position to maintain the health of its tissue mills.

7

MARKET PULP

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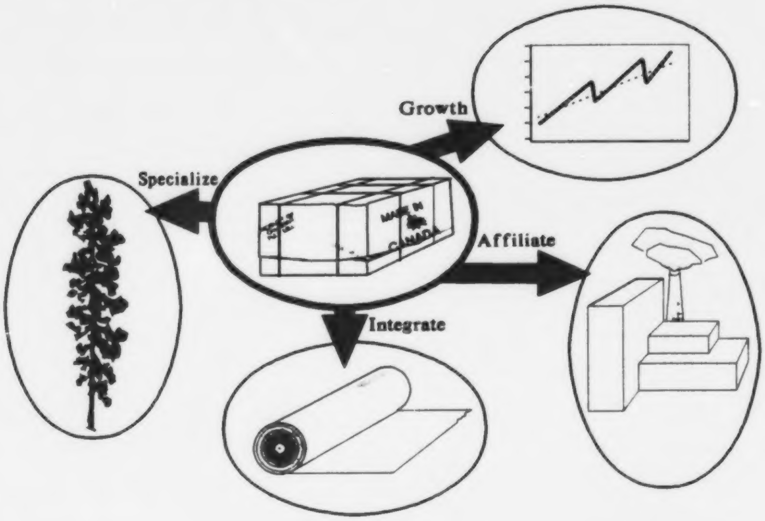
CANADIAN MARKET PULP



Overview

The market pulp business, like other segments of the worldwide pulp and paper industry, is in the midst of fundamental change. During the 1982/84 recession, Canadian market pulp producers experienced the most devastating market conditions on record. In a rapid reversal, 1987/88 may well be the most favourable conditions ever experienced by the industry. The last two market swings underscore the cyclical nature of the market pulp business.

However, there are underlying trends which will make the traditional Bleached Kraft Pulp (BKP) commodity market pulp business even less attractive in the long-term, than it has been in the past, despite the current buoyant and profitable conditions. Many Canadian producers of commodity grades of BKP are using their profitable positions to make investments that will change the nature of their business. Cost control and productivity measures are at the core of the expenditures, but the upgrading of products is a general theme in the strategies being adopted.

Future opportunities will centre around the integration or affiliation of pulp mills with paper or paperboard facilities, or upgrading pulp product qualities into specialty grades. While the commodity market BKP business is threatened in the long-term, there are segments of the market pulp business which promise to remain attractive, providing productivity and quality are made internationally competitive. The message to commodity BKP producers, especially the smaller, less efficient producers, is clear: INTEGRATE, AFFILIATE OR SPECIALIZE.

Grades other than Bleached Softwood Kraft Pulp (BSKP), which are emerging as attractive future alternatives or supplements, include other segments of the chemical pulp market, specifically Bleached Hardwood Kraft Pulp (BHKP) and high-yield chemi-thermo-mechanical pulps like CTMP. These will offer attractive opportunities as furnish components in a growing number of applications, notably tissue and towelling grades, printing and writing papers, and folding boxboard.

Demand for BHKP has increased rapidly as hardwood pulps have been accepted as providing key quality and cost factors in a wide range of printing and writing paper grades. High yield pulps offer an attractive economic alternative to the higher cost of chemical pulps, as well as superior and/or acceptable performance characteristics in many applications.

Increasing competition for fibre in the longer term will demand trade-offs between forest products as the opportunities for growth in all product sectors become fibre constrained. This fibre competition will shape the restructuring of the BKP industry.

Some existing pulp operations will become integrated in response to growing demand for printing and writing paper. New "greenfield" BKP plants will be curbed by the growing competition from other grades of pulp. Indeed, it is expected that some of the less efficient capacity will be withdrawn from production and the fibre diverted to new growth in other pulp and paper grades.

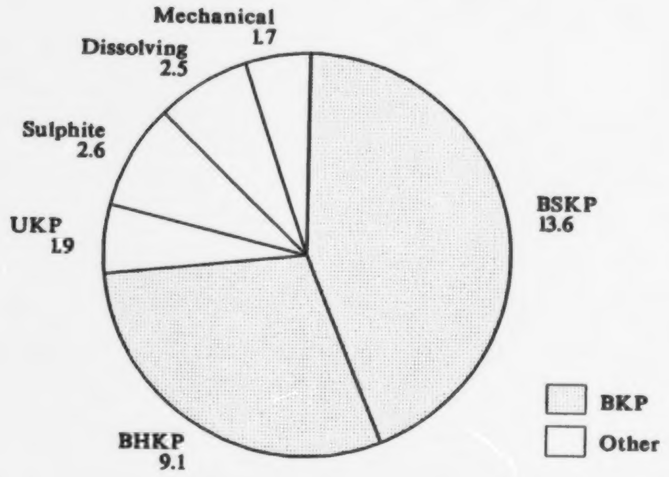
Size and Nature of the Market

In 1986, approximately 146 million tonnes of all grades of pulp (wood pulp and non-wood fibres) were used to produce more than 203 million tonnes of paper and board worldwide. The balance of the paper and paperboard furnish was primarily recycled fibres (waste paper), and miscellaneous fillers and coatings.

Most of this pulp requirement is produced by the paper or paperboard manufacturer. A smaller portion, approximately 20-22%, is purchased from world market pulp producers and transferred to paper and paperboard mills, which are either affiliated with the producing pulp mill, or are partially independent or nonintegrated operations.

A number of pulp grade categories are traded as paper grade market pulp but the picture is dominated by BKP (Figure 7-1).

Figure 7-1
World Market Pulp Shipments 1986
(millions of tonnes)

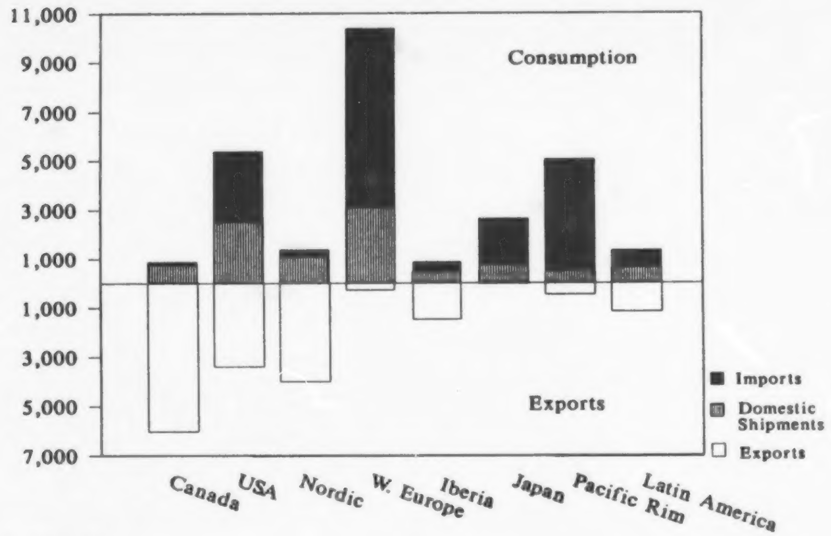


TOTAL 31.4 million tonnes

Source: WRA (PPI Annual Survey, RISI)

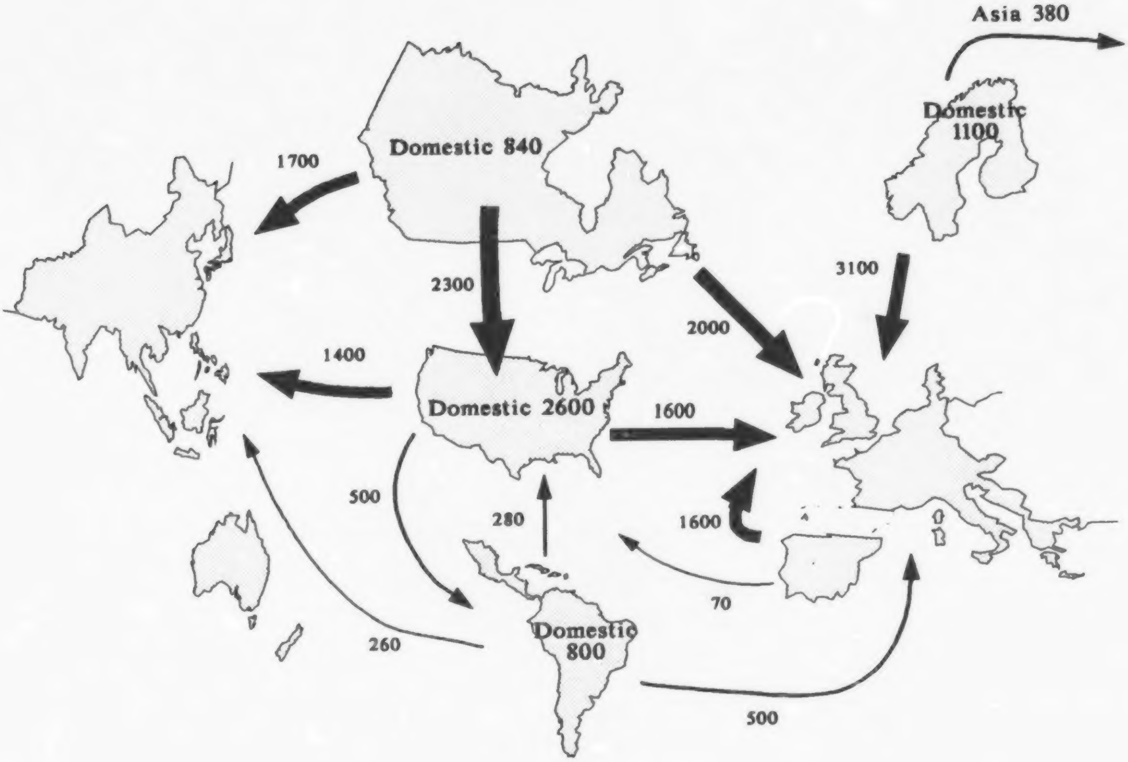
BKP is traded internationally with major trade flows moving from Canada, US, and Nordic countries into Continental Europe, Japan and the Pacific Rim, and also from Canada into the US (Figure 7-2 and 7-3).

Figure 7-2
International Consumption and Trade of Market BKP1987
(thousands of tonnes)



Source: WRA database

Figure 7-3
Market BKP
Major Trade Flows 1987
(thousands of tonnes)


Asia 380
Domestic 1100
Domestic 840
1700
2300
3100
2000
1400
Domestic 2600
1600
500
280
1600
70
Domestic 800
260
500

Source: WRA (RISI, International Association Statistics)

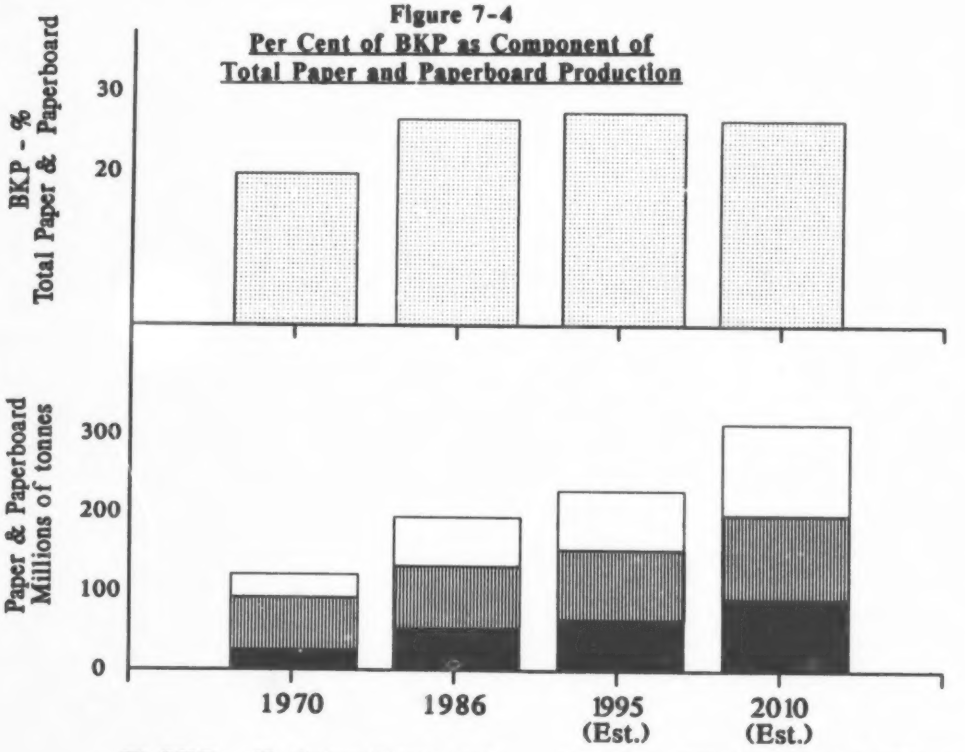
The market pulp business has always been highly cyclical, but has nevertheless enjoyed growth and periods of good prosperity over the past two to three decades. It has also incurred high debt problems during downturns, when the marginal role of market pulp is disadvantaged. Fundamental changes are now evident, and these are forcing traditional producers to rethink their role in this industry. These trends are:

- A declining role for independent Norscan market BKP producers;
- a shift in capacity to new BKP entrants located in low cost producing regions of the world;
- corporate concentration designed to include captive sources of pulp.

Declining Role for Independent Producers

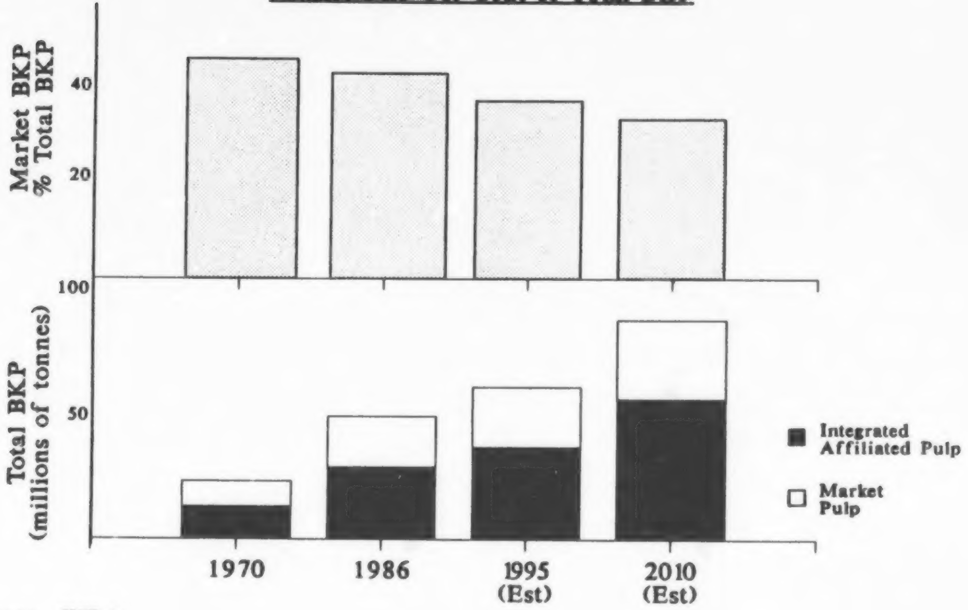
The use of BKP in paper and paperboard has increased, both as a percentage of the furnish and in absolute terms (e.g. from 1970 to 1986) as shown in Figure 7-4. We forecast that the percentage of BKP in paper and paperboard will remain relatively constant to 2010, but the significant increase in paper and paperboard production will translate into a large increase in BKP usage (i.e. from 54 million tonnes in 1986 to over 90 million tonnes in 2010). With respect to market BKP, the growth in demand will be much less, due to a reduction in the percentage of market BKP of total BKP as seen in Figure 7-5.

Figure 7-4
Per Cent of BKP as Component of
Total Paper and Paperboard Production



Source: WRA database

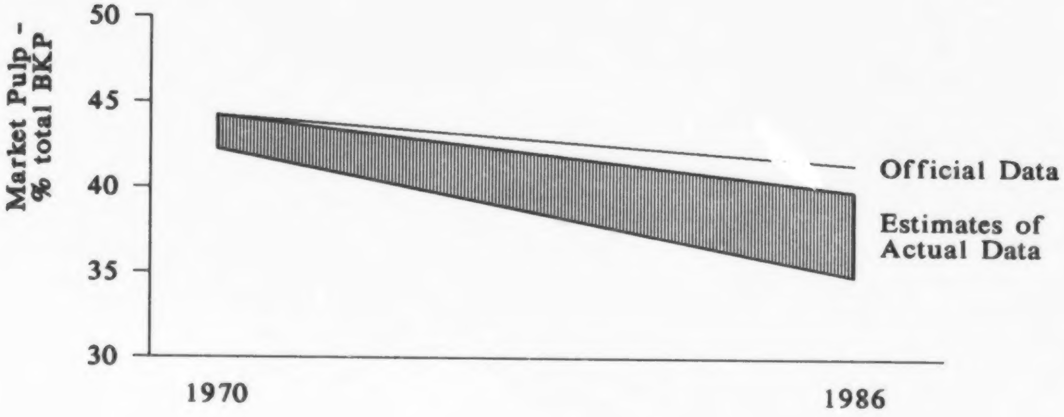
Figure 7-5
Market BKP Per Cent of Total BKP



Source: WRA

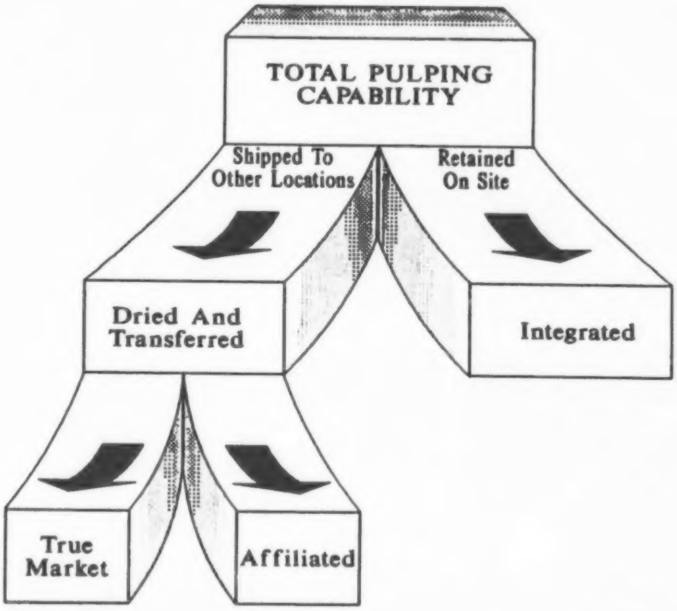
These figures do not reveal the entire story, however. This is due to anomalies in the data which classify significant quantities of affiliated transactions as market pulp. These are instances when agreements between large paper and paperboard producers result in "trades" of pulp, the main purpose of which is to reduce freight costs. Therefore, the "true market pulp" figures are somewhat lower than the above analyses (Figure 7-6). This was not a major issue 10-15 years ago but has taken on more importance over the last decade.

Figure 7-6
Market BKP Per Cent Total BKP
Official vs Actual Data



Source: WRA estimates

For clarification, the pulp supply structure of the global pulp and paper industry can be depicted as follows:


TOTAL PULPING
CAPABILITY
Shipped To
Other Locations
Retained
On Site
Dried And
Transferred
Integrated
True
Market
Affiliated

Approximately 42% of world BKP is produced, dried, and baled in one location and transferred to another location for conversion into paper and paperboard. The "dried and transferred" category originates from pulp mills dedicated solely to producing dried pulp and also from integrated operations which have pulping capacity in excess of their paper and paperboard production capacity.

"Dried and transferred" pulp is shipped as two main categories:

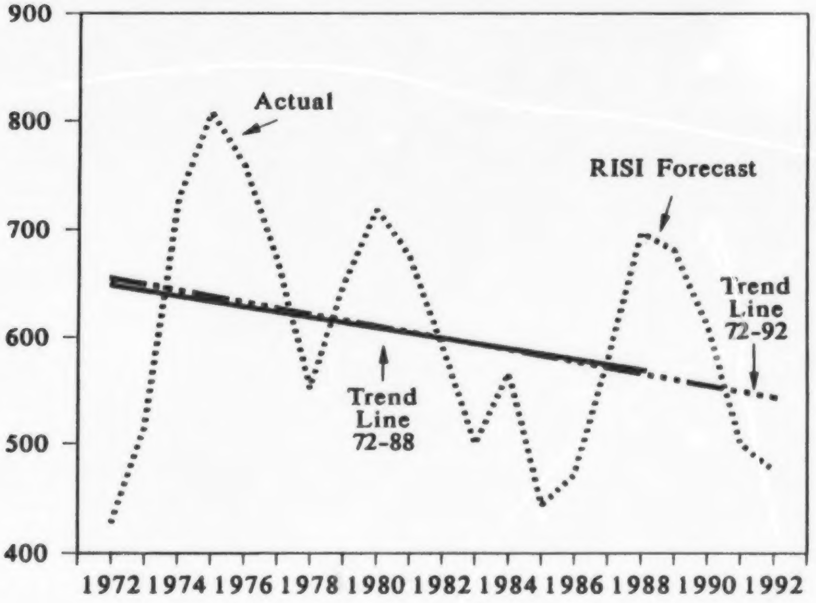
1. *"Market pulp", sold as the result of an "arms-length" transaction between buyer and seller, and directed primarily to world independent paper and board manufacturers.*

2. *"Affiliated or captive pulp" which is transferred to a paper or paperboard manufacturing unit owned by, or associated with, the pulp producing unit. Where possible in this report reference is made to these two categories, but it is often difficult to segregate the statistics. Within North America details are available, but all of the pulp exported overseas from North America and all pulp shipments from other supply regions are recorded as "market pulp". The trend of increased mergers, acquisitions, and joint venture activity in the industry is reducing the number of independent paper/paperboard producers, and thus increasing affiliated pulp movements.*

This trend to increased affiliation of BKP supply will likely amplify the market BKP supply/demand cycles (due to a narrower trading range), which in turn would result in continued, and perhaps increased, fluctuations of market BKP prices and hence profits.

The root cause of the chronically unstable pricing history for BKP (See Figure 7-7), lies in an amplification of the natural supply/demand relationship that occurs in most commodity industries. When paper and paperboard production falls off, there is a surge of integrated or affiliated pulp into the "market pulp" supply chain, at precisely the point at which cyclical demand for market BKP is declining. Price fluctuations in the order of 25-35% within a cycle have been common in recent years. The price fluctuation within the current cycle has already surpassed 80% (i.e. from $400/t to over $730/t).

Figure 7-7
Price History - Softwood BKP
(Constant 1987 US Dollars)



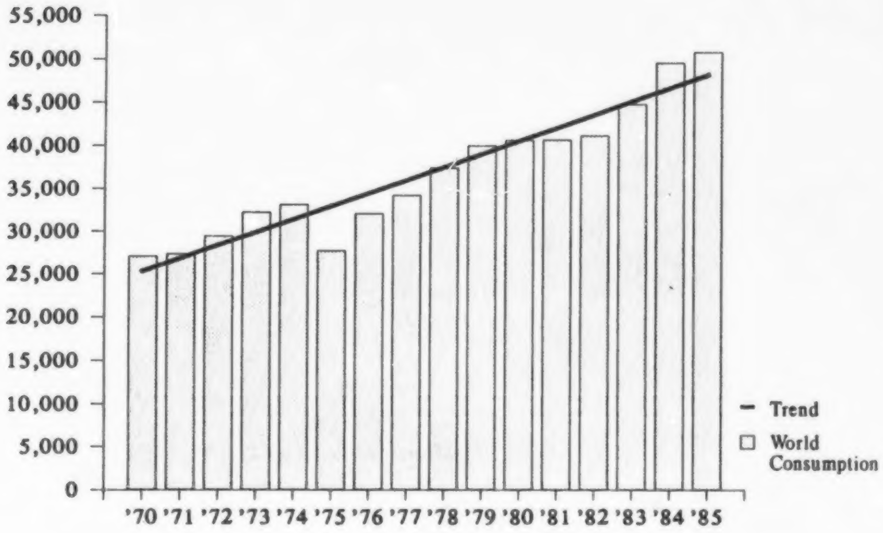
Source: WRA

The reduced role that true market BKP will play in the total supply picture will exacerbate the impact of this residual supply phenomenon - with even more pressure on price cyclicality than ever.

The driving force behind this trend lies in the changes that are occurring in the pulp and paper industry. The pulp supply structure included a significant quantity of pure market pulp 10-15 years ago, but has gradually integrated on-site or became affiliated with previously nonintegrated paper and paperboard mills. Furthermore, as new BKP capacity has been installed, a declining portion of the new capacity has been built as "true" market pulp, especially in the traditional North American and European industries. Increasingly, new paper and paperboard facilities are built as part of an integrated complex.

The rise and fall of true market BKP has a logical historical root. Since 1970, the demand for printing and writing papers has experienced rapid global acceleration (Figure 7-8). This has spawned a similar growth in demand for BKP as the primary furnish component. During this period, a large volume of this printing and writing paper demand has been satisfied through the conversion and expansion of older, smaller, nonintegrated paper mills.

Figure 7-8
World Consumption
Printing and Writing Papers
(thousands of tonnes)



Source: WRA

The trend to convert older machines to higher value printing and writing grades will continue. This will proceed at a slower pace in the future, however, as many of the eligible upgrades have already occurred leaving limited potential for further upgrading.

Increasingly, to remain competitive, economy of scale will drive additional capacity in printing and writing grades to new or upgraded mills with integrated or affiliated sources of pulp. Competitive cost pressures dictate large-scale modern facilities for the production of these products, e.g. LWC, SC papers and many of the free sheet grades.

The number of paper and paperboard mills in the world has reduced dramatically since 1970, despite the large number of new mills built during the same time period.

Table 7-1
Number of Paper/Paperboard
Mills - World 1970-1986

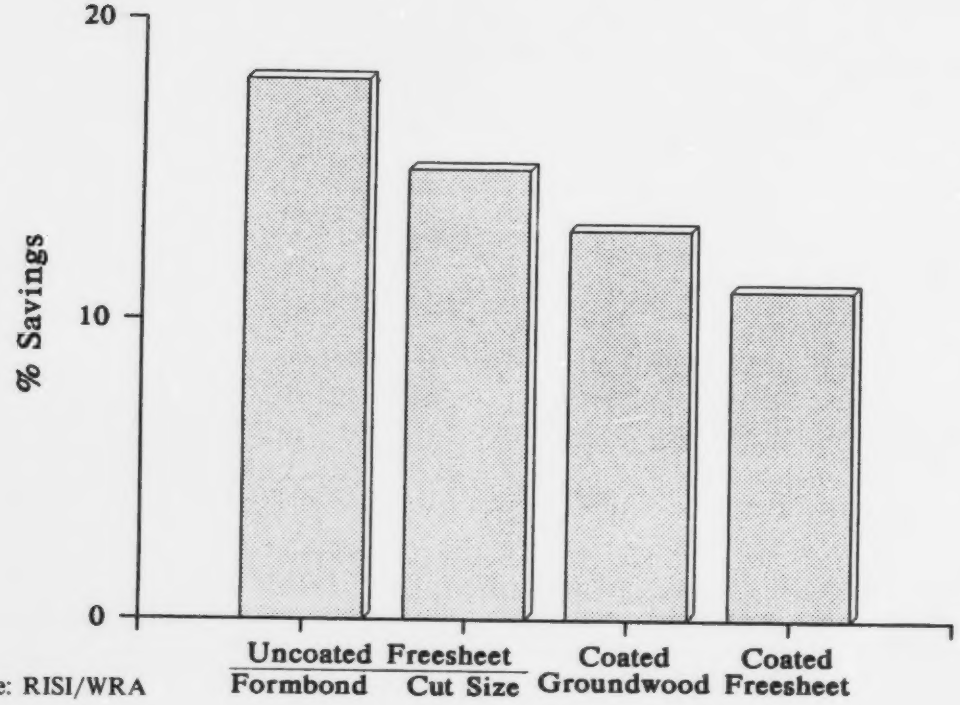
Number of Mills	1970	1986	Reduction
US	809	561	248
Canada	138	76	62
W. Europe	1,705	1,307	398
Japan	654	489	165
Total	**3,306**	**2,433**	**873**

Source: PPI

This rationalization process is removing many of the nonintegrated producers who rely on market pulp for their fibre supply.

In addition to this rationalization, increased economies of scale of some grades are making integration more attractive. Figure 7-9 shows how integration benefits uncoated freesheet grades more than either coated freesheet or coated groundwood (LWC) for example.

Figure 7-9
Cost Savings From Integration
Various Printing and Writing Papers



Source: RISI/WRA

Notes:

1. Typical cost for average facility in US.
2. Costs are cash costs of operation; depreciation and interest costs are not included.

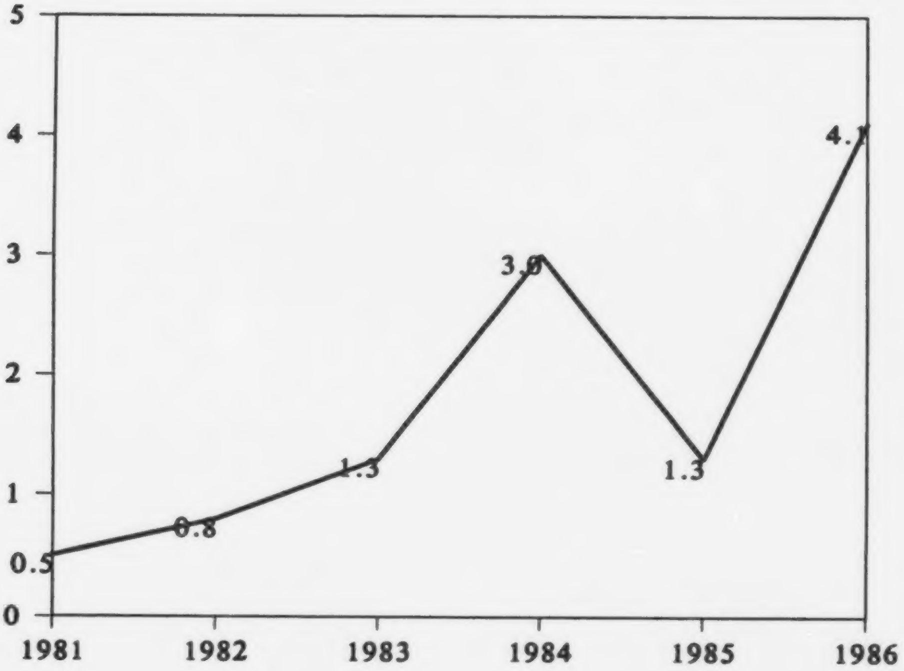
Admittedly this trend of increased integration has more complex roots. Security of supply is also increasingly an issue as the "thin market"[1] becomes increasingly thinner. Also, increasing corporate concentration is clearly both a driving force behind, as well as a result of, vertical integration between pulp and paper producers.

---

[1] The "thin market" refers to the small role that arms length transactions play in the total supply picture.

An example of this trend is the high degree of merger and acquisition activity in the US in recent years (Figure 7-10), reaching US$ 4.1 billion in 1986.

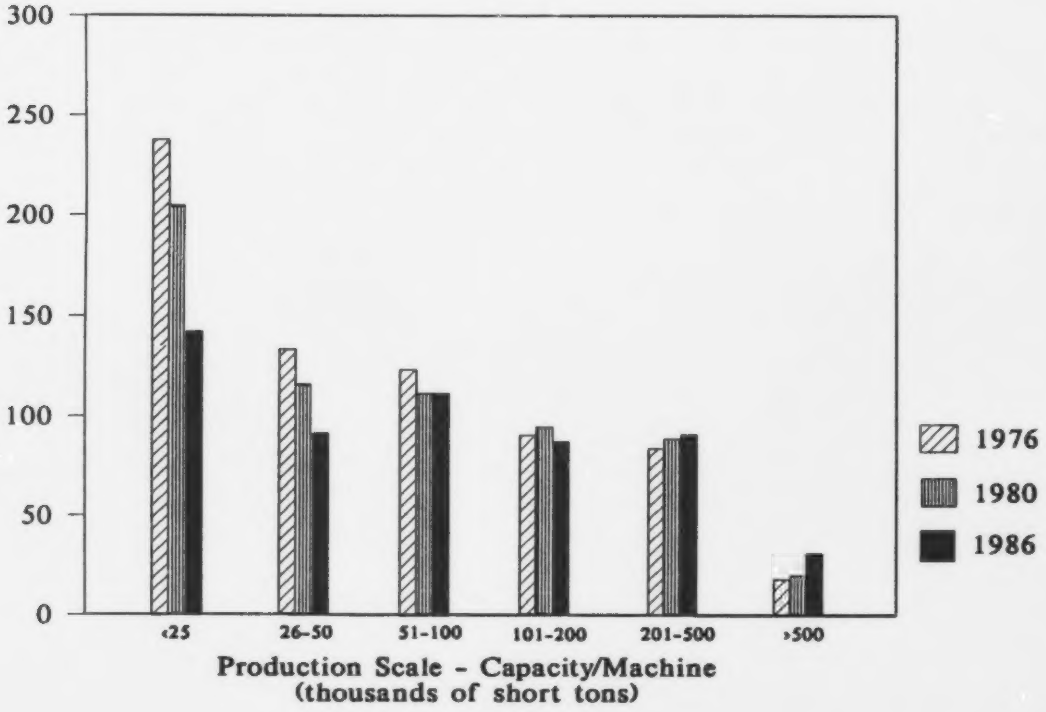
Figure 7-10
Values of US Pulp and Paper Mergers and Acquisition Activity
1981-1986
(billions of US$)



Source: WRA

The structure of the US paper and paperboard industry has changed as a result of this merger and acquisition activity. Many small mills have been shut down over the last decade and the capacity replaced with fewer large-scale mills (Figure 7-11).

Figure 7-11
Structure of US Paper and Board Industry
(Number of mills and productive capacities)

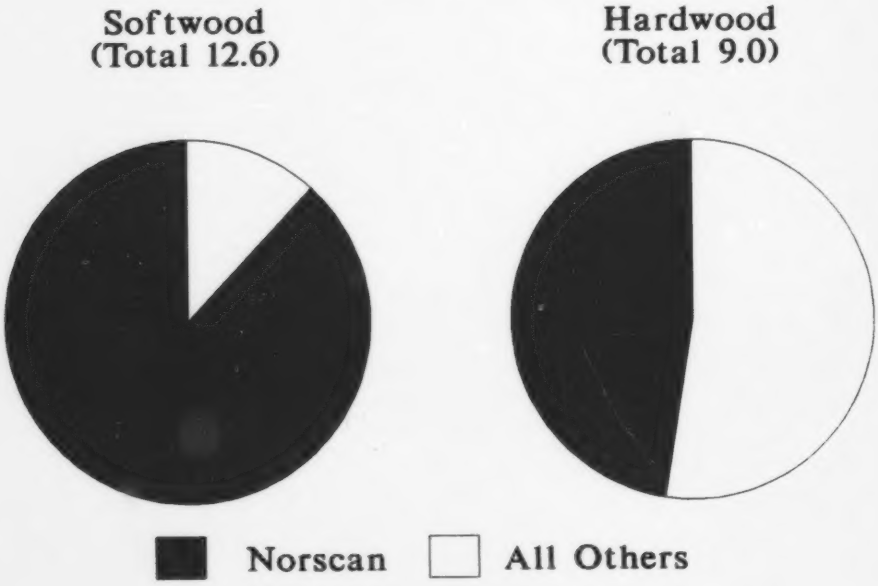


Source: API, WRA

Capacity Shift to Emerging Economies

The Norscan countries (Canada, US, Sweden, Finland and Norway) are the primary world market pulp producing regions. In 1986 these regions produced more than 89% of the world BSKP and 47% of the BHKP (Figure 7-12).

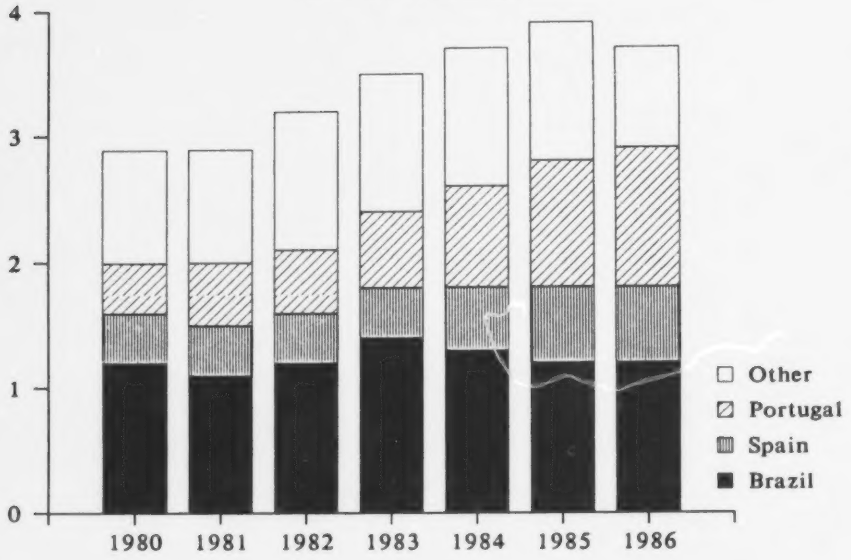
Figure 7-12
Norscan Dominance of BKP
Market Pulp Production
1986



Source: RISI, International P & P Associates Statistics, PPI

Despite the domination by the Norscan group, the last decade has witnessed growth in capacity by nontraditional producers, especially in hardwoods. Demand for plantation eucalyptus from both Latin America and the Iberian Peninsula has grown rapidly following the enthusiastic acceptance of this pulp by printing and writing producers around the world. This growth has slowed somewhat since 1980 as shown in Figure 7-13.

Figure 7-13
Market Pulp Production - BHKP
Non-Norscan Producers
(million of tonnes)



Source: RISI and National P & P Associates Statistics

The latent potential for large volumes of BHKP from Iberia is now being realized. In spite of problems in Portugal relating to conflicts between the agricultural and forest sectors, and the need for a restructuring of the pulp and paper industry in both Spain and Portugal following admission to the EEC, expansions are planned. Already Iberia is the world's largest regional supplier of eucalyptus bleached hardwood kraft pulp (BEKP), and several new mills are expected to start up in the next 15 years.

Integration and joint ventures are in place in Portugal, and the government has started to plan future development of pulp production from controlled and managed plantations. Chip exports are being discouraged and will likely be banned. By the end of the century it is considered likely that this region will ship three million tpy, in contrast to the 1987 volume of about of 1.7 million tonnes.

The 1987 PPI Annual Review called Brazil "the dormant giant". With justifiably much heralded publicity, plantation eucalyptus appeared onto the world market pulp scene about 20 years ago after large production facilities started up in Brazil, based on rapid growth plantations (7-10 years). Brazilian pulp was exceptional in its international acceptance, and has been eagerly sought by papermakers throughout the world.

The expectation was that several additional mills would be in operation by 1990, and that existing mills would expand. Export marketing plans were very ambitious. But supply from Brazil has been constrained by major investment and financial hurdles, and by the repatriation of export tonnage to furnish escalating domestic paper/board demand. Export volume has been stagnant at about 800,000 tpy for the past few years. New capacity will certainly be built, but there is question as to when this incremental pulp will be available for world markets. Realistic anticipation should probably focus on the early 1990s.

Aracruz has finally announced a doubling of its 500,000 tpy capacity by 1990. Other projects which are under active study, when completed are expected to add another million tonnes to Brazil's market BHKP capacity by the year 2000. In addition, successful development of softwood plantations will add up to 100,000 tpy BSKP capacity in the 1990s.

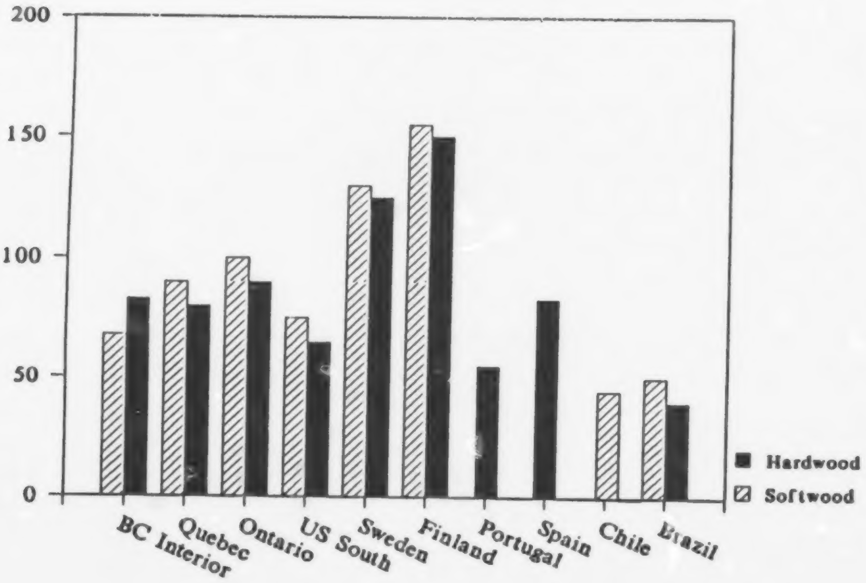
Both Argentina and Chile have also emerged as world market pulp suppliers. About 400,000 tpy of BSKP is shipped from the two countries, with an additional 120,000 tpy of UKP being exported from Chile.

Current plans are under way to at least double capacity in Argentina in the short-term. There is one mill which is partially completed, awaiting further financing. Another existing mill is considering increasing capacity. Production of BHKP from existing and new plantation wood is being planned, so that by the end of the century an additional 500,000 tpy of market pulp from Argentina is a reasonable expectation.

The Chilean industry is in the midst of reorganization. There have been plans to increase market pulp production from today's 500,000 tpy by developing up to three new BSKP mills. The potential also exists for the production of BEKP based on plantation wood. If these projects proceed, possibly with foreign joint venture participation, more than one million tpy of market pulp could be available from Chile by the year 2000.

The driving force for this dramatic capacity addition is fast-growing plantation wood in these regions which provide a significant cost advantage over Norscan producers, especially Finland and Sweden (Figure 7-14).

Figure 7-14
Comparative Wood Costs
(C$ per bone dry tonne)



Source: WRA

The regions which have fast growth hardwoods and softwoods, [notably Brazil, Spain and Portugal (hardwoods), and Chile (softwoods)], are expected to have increasing volumes of wood available for use as pulp and paper furnish between now and 2010.

Due to the nature of the growing conditions in these regions, wood is available for harvesting in much shorter time spans than in North America and the Nordic countries. Therefore, it is expected that the trend will continue to increase plantation growth in these regions.

One of the results of this supply shift to low cost supply regions is a cost-led decline in real pricing for pulp. This trend will threaten the profitability of market pulp producers in historical supply regions such as Canada.

However, there are aspects to the changing nature of the pulp business that provide real opportunities for many established producers. The economic need to upgrade old paper mills will result in new enlarged facilities concentrating their output on high volume semi-commodity grades. This will allow the surviving economically viable, smaller (and primarily still independent) mills to concentrate on specialized paper and paperboard grade production. Specialty market pulp with high standards of quality and consistency will become increasingly important. In the rapidly growing countries of the Pacific Rim, the need for imported high quality market pulp to increase domestic paper/board production will be strong until domestic pulp production can be developed.

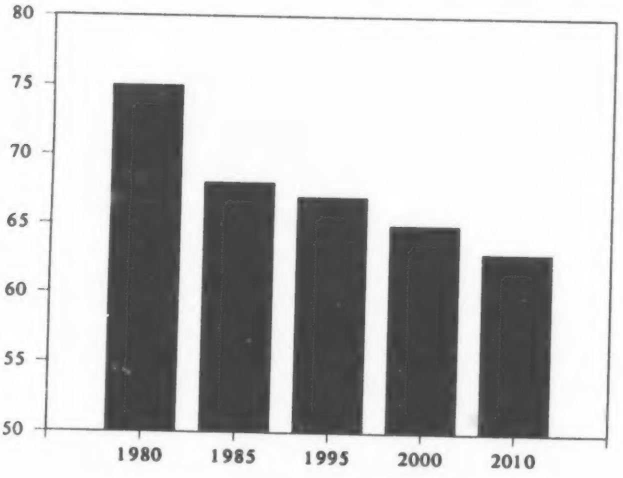
Existing market BKP mills can continue to prosper by modernizing, specializing and integrating into paper or paperboard. In some cases this can be achieved by on-site integration. In other situations it will be achieved through the acquisition of, or affiliation with, independent paper or paperboard producers.

New Canadian mills will be justified on the basis of integrated BSKP and/or BHKP (e.g. Weyerhaeuser, Prince Albert and Domtar, Windsor), affiliated BHKP (e.g. Daishowa), or new grades such as market CTMP (e.g. Millar Western and Fibreco).

Implications of Future Pulp Demand

The use of woodpulp as a component in the manufacture of paper and paperboard is increasing in absolute terms, but declining in percentage terms (Figure 7-15).

Figure 7-15
Estimated Woodpulp Consumption
As Per Cent of Paper Production
(millions of tonnes)



Source: WRA

There has been a growing trend to use more recycled fibre and fillers in the manufacture of paper and paperboard, driven by the need to reduce production costs and to provide more variety of printing and writing papers. However, the absolute volume of pulp consumption in 2010 will be in the order of 220 million tonnes, compared to 130 million tonnes in 1985.

Paper and paperboard manufacturers will accelerate their search for lower cost raw materials and new technology so that they can remain competitive. This in turn will further assist the industry to resist threats of substitution by nonpaper products. Changes in paper and paperboard specifications will be directed at lowering the end-use cost of communication and packaging products. A combination of papermaking expertise and improved technology will offer the means to achieve raw material cost reductions, while at the same time, ensure continued product improvement.

There will be substitution between grades of pulp, sometimes driven by pulp price considerations rather than grade characteristics, and facilitated by new technology and process equipment. No market pulp producer should assume continued acceptance. Each must maintain an active link with the market and be aware of all the competitive activity in the international pulp arena. This will require changes to traditional practices in Canada, and will require a focus on species segregation, individual order specifications, and investment in sophisticated process controls that improve both the consistency and uniformity of market pulps.

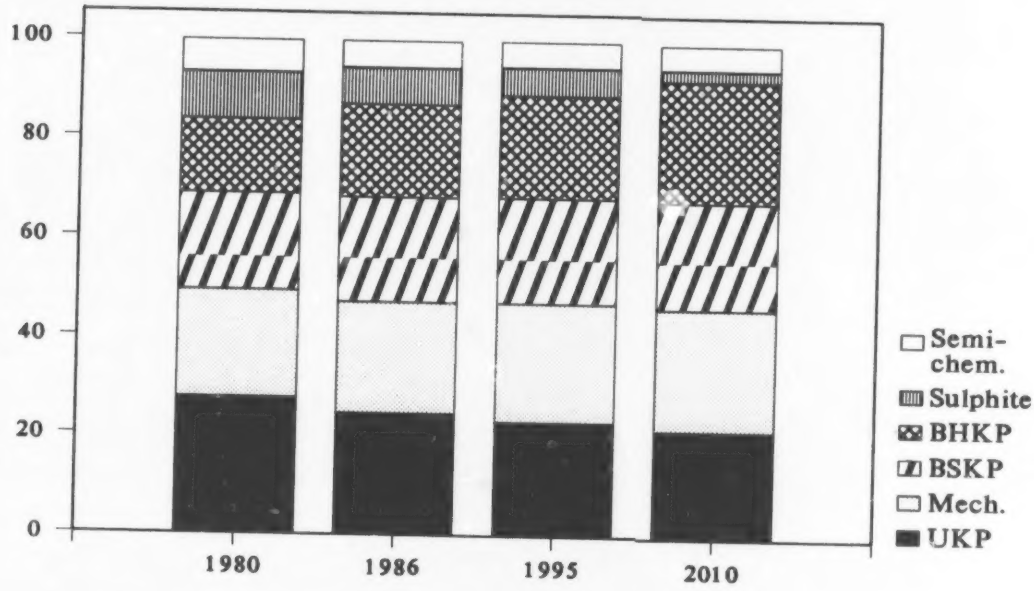
The quality and cost advantages of pulp from emerging softwood and hardwood producing regions will affect Norscan supply. However, the absolute strength qualities of northern fibres will still be needed, even though the proportion will be lower than in the past. There will be continued opportunity for top quality northern softwood BKP produced and marketed in accordance with the changing requirements of paper and paperboard manufacturers.

Increased Use of Hardwood Kraft Pulps

The inherent qualities of hardwoods, especially the premium eucalyptus grades, are valued by paper and paperboard producers. High quality grades of paper and paperboard exclusively using hardwood are being marketed. In addition to the quality reasons, paper and paperboard producers will substitute BHKP for BSKP if the pulp price differential is favourable.

The pulp usage trends to 2010 are shown in Figure 7-16. We expect a net reduction in the percentage of semi-chemical, sulphite and UKP and a net increase in the percentage of BHKP and mechanical pulps.

Figure 7-16
World Apparent and Estimated Consumption of Paper Grade Pulps
1980 to 2010
(% of total of each grade)



Source: WRA Data Bank RISI

There has been a move away from heavy dependence on northern BSKP since lower cost southern and radiata pine softwood pulps have become increasingly available. The rapid increase in the use of natural and plantation hardwoods, the continued reduction of chemical pulp from newsprint production, and the introduction of super-absorbent additives for diaper production have reduced demand for BSKP. However, the percentage of total paper grade pulp usage will remain relatively constant.

Increased Availability of High Yield Mechanical Pulps

The initial success of RMP and TMP have paved the way for the evolution of the more advanced grades like CTMP and bleached CTMP. Aggressive research and development will improve process technology, especially brightness reversion, allowing for the inclusion of a higher proportion of high yield pulps in paper/board furnishes not currently using these pulps.

The advent of CTMP offers many paper and board manufacturers an opportunity to benefit from lower cost pulp as well as the potential for integrated pulp production.

Furnish Changes in the Traditional Grades of Paper and Board

Historically, a clear differentiation between mechanical and freesheet paper grades and some packaging products has evolved, and the specifications have been jealously upheld by industry participants. Today more grades are being engineered to meet the specific end-use requirements (e.g. the new composite papers using high yield pulp and very high filler content will replace some grades with high chemical pulp content). Printers and converters can thus provide their customers with products of acceptable quality at more competitive prices. This trend will accelerate as more alternative grades are developed.

Increased Usage of Fillers and Coating Agents

The continual quality push, coupled with the emergence of heatset offset printing, has resulted in a significant increase in the use of filler and coating agents. In most producing regions, the cost of fillers is less than pulp which further encourages its use. This trend is now becoming evident in North America.

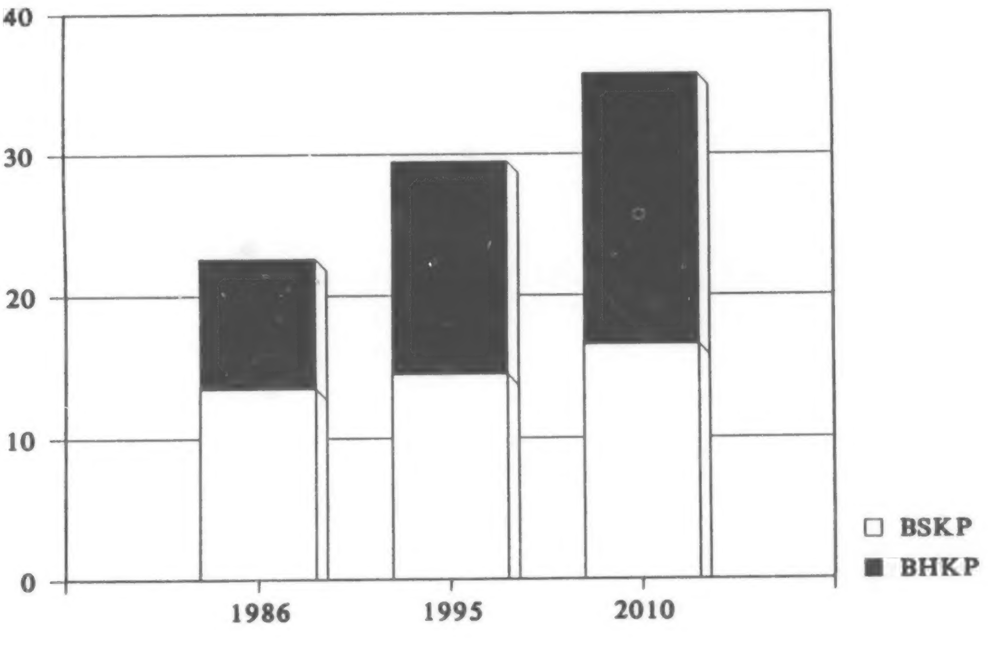
Increased Use of Recycled Waste Papers

Most countries are moving to reach maximum secondary fibre usage in many packaging grades. Improved deinking processes have enabled higher use of recycled fibres in printing and writing grades, and newsprint producers are able to blend more waste in their furnishes without any significant loss of quality.

Implications for Market BKP

While many of the preceeding phenomena will reduce the demand growth for BKP, the requirement for a strong chemical pulp will be increased. Use of fillers, both organic and inorganic, will increase the need for some strong components in the furnish. While the ratio of BKP supplied as "true" market will decline, there will be a need for an additional volume of at least 10 million tpy of market pulp by 2010 (Figure 7-17). These estimates are made with judgments applied to the degree of practical on-site integration at existing and new facilities, combined with the forecasted total BKP demand. Within this scenario, the hardwood component will grow faster than softwood and will therefore provide the better opportunity for producers who are unable to affiliate or integrate.

Figure 7-17
BKP Global Consumption of Market BKP
BSKP and BHKP, 1986 Annual Forecast 1995-2010
(millions of tonnes)



Source: WRA estimates

Market Mechanical Pulp

Until the 1970s, market mechanical pulp was primarily stone groundwood (SGW). At that time, mechanical pulp grades produced from chips began to appear; first refiner mechanical pulp (RMP) followed by thermomechanical pulp (TMP). More recently, chemi-thermomechanical pulp (CTMP) is becoming established worldwide as a useful and cost competitive alternative.

Despite the recent rapid growth and interest in CTMP, total market volumes of mechanical pulps are small, accounting for just under 5% of "dried and transferred" pulp shipments in 1986 (Table 7-2).

Table 7-2
World Market Mechanical Pulp Shipments
1986
(millions of tonnes)

	Volume	% Total *
SGW	0.67	2.3
RMP, CMP, TMP	0.36	1.2
CTMP	0.43	1.4
Total	**1.46**	**4.9%**

* % of total dried and transferred pulp

Source: WRA database

The annual capacity of the world's existing market CTMP mills is estimated to be 780,000 tonnes. An additional 1.1 million tpy is projected to come on stream by 1990.

Bleached CTMP is the most recent major grade of market pulp, and its initial experience is reminiscent of the introduction of Southern US and radiata pine grades of BSKP and eucalyptus BHKP. There was industry-wide resistance, as well as some ridicule by the pulp "establishment". But in the end, market demand increased as these grades were proven to be effective from both a cost and quality viewpoint. The incentive of using a less expensive pulp produced a concentrated technological effort into finding ways to use these grades in paper and paperboard production which once had been the exclusive preserve of northern BSKP. The escalation of chemical pulp prices will provide an added opportunity for the inclusion of high yield pulps in paper and paperboard furnishes.

To date, there has been a reluctance by many potential users to devote too much time and expense in the development of the technology required to effectively utilize CTMP. This is partly due to the limited supply and number of CTMP market pulp producers, and partly because of the generally inconsistent quality reputation which has existed until recently. The significant capacity addition expected in the next few years should alleviate some of these concerns.

CTMP is now included in many paper and paperboard furnishes. The emerging availability of both low and high freeness CTMP with high brightness targeted for the manufacture of printing and writing grades and tissue/towelling grades, is creating considerable interest worldwide. Of particular relevance to Canada is the fact that CTMP, which contains a high proportion of hardwood (especially aspen), is well suited for printing and writing paper production. It has also been demonstrated that CTMP improves the intrinsic quality of products such as multi-ply board. As technology develops and is exchanged between CTMP producers and paper and paperboard manufacturers, CTMP will become a permanent raw material component in the paper and paperboard industry.

The imminent availability of new market CTMP tonnage will facilitate a wider market acceptance for the product. It will take some time and will require sophisticated technical marketing in order to gain the confidence of the world's paper and paperboard producers. It will be a prodigious challenge to present the positive technical advantages and commercial benefits of bleached CTMP to international paper and board producers.

The printing and writing paper industry is conservative and has focussed on woodfree grades for the upper spectrum of its products. Producers' and consumers' attitudes are well entrenched. Long established specifications limiting the amount of non-chemical pulp (i.e. mechanical) which can be included in these grades have precluded change.

However, when the needs of end-users, such as advertisers and printers, can be satisfied at lower cost with paper containing an increased quantity of high yield pulp, the trade specifications will change. New grades have already appeared in Europe containing CTMP and higher volumes of fillers. Once these papers find their classification niche, other paper producers will be forced to meet the competition.

By the year 1990, Canada will have more than 50% of the world's anticipated market CTMP capacity of just under 1.9 million tonnes. The new volume is being introduced in a remarkably short period of time, and success will demand a strong and coordinated marketing program. It is imperative that Canadian producers achieve an early reputation of being leaders in CTMP in order to maximize this opportunity. This will be achieved by proactive technical support and consistent supply of a uniform product.

Once established, there will be considerable opportunity for Canadian softwood, hardwood and mixed softwood/hardwood CTMP in world markets, especially in those countries which have high energy costs and where individual mills cannot justify the capital cost of an integrated CTMP mill.

Other Grades of Market Pulp

World bleached and unbleached sulphite market pulp capacity is now below two million tpy compared to about three million tpy 10 years ago. Today 95% of this capacity is bleached. Canadian capacity is about 300,000 tpy, or 3% of total market pulp. (In this report, bleached and unbleached sulphite are referred to as BSP).

Unbleached kraft pulp (UKP) is almost all softwood, and 65% of the world's annual market capacity of about 1.7 million tonnes is located in regions other than North America and the Nordic countries (Norscan). This is in contrast to the annual capacity of more than 2.0 million tonnes in 1976, over half of which was produced by Norscan countries. Canadian UKP market capacity, is now 130,000 tpy, and is likely to decrease.

World shipments of dissolving grades of market pulp total about 4.3 million tpy, of which there are now less than 200,000 tonnes in Canada. In times of strong paper pulp demand, dissolving pulp producers often increase their ratio of paper grade shipments to take advantage of the higher prices.

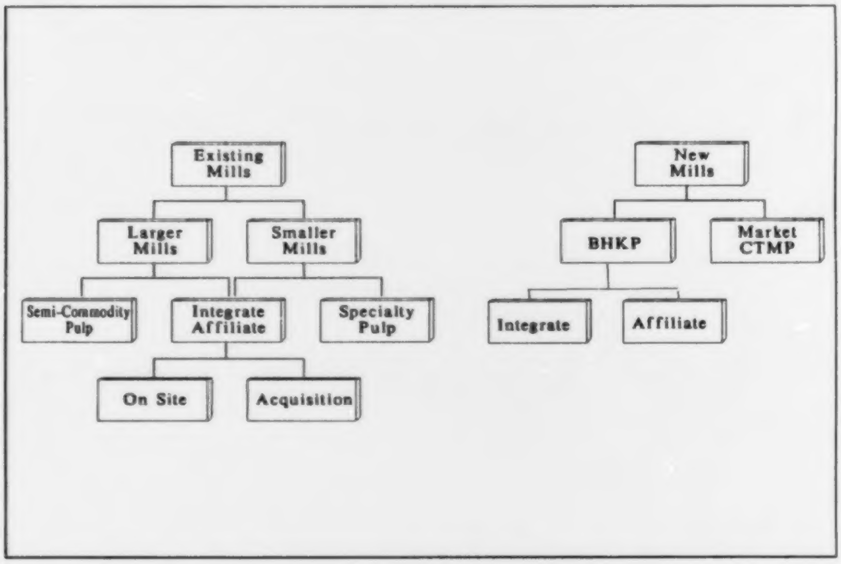
National Strategic Implications

The preceding analysis points to a national strategy that involves more integration, more affiliation and/or more specialization. This is driven by trends in the international industry which we are convinced are becoming increasingly unfavourable for Canadian commodity BSKP producers in the long-term (in spite of the current extraordinarily favourable market conditions). There are attractive opportunities for specialized BKP grades and for high yield mechanical pulps, and the future for integration or affiliation with paper producers is even more positive.

We feel there will be an incremental demand of 10 million tpy of BKP by the year 2010, and this will obviously provide an opportunity to low cost Canadian pulp producers for at least some of their additional tonnage. For those mills which are internationally cost competitive, some of their output can be dedicated to the market in addition to integration/affiliation. We do not foresee or recommend that a Canadian greenfield mill should become solely a market pulp producer.

The particular strategy chosen by individual companies will, of course, depend on many site-specific and individual corporate conditions, but a generalized model (Figure 7-18) is appropriate to summarize the situation and present general guidelines.

Figure 7-18
Strategic Alternatives for
Canadian Market Pulp Producers


Existing Mills
Larger Mills
Smaller Mills
Semi-Commodity Pulp
Integrate Affiliate
Specialty Pulp
On Site
Acquisition
New Mills
BHKP
Market CTMP
Integrate
Affiliate

Source: WRA

Large-scale pulp mills may need to pursue a combination of both integration and affiliation. The size of most large pulp mills requires the addition of more than one paper machine to achieve full integration. Alternatively, an acquisition strategy would normally require more than one moderately sized nonintegrated paper producer to achieve full integration. In some cases, therefore, a combination of the two approaches may be necessary.

A further complication is the need for both BSKP and BHKP in most printing and writing papers. Full integration through affiliation, therefore, requires the inclusion of both types of products in the affiliated complex.

Smaller scale Canadian market pulp mills could pursue a similar strategy, but may also have the opportunity to produce northern BHKP or more specialized BSKP grades. A shift to BHKP provides a short-term opportunity because of its continued rapid growth. Eventually, however, Canadian BHKP is likely to become as vulnerable as BSKP because of the continued expansion of relatively low cost eucalyptus based on plantation wood supply.

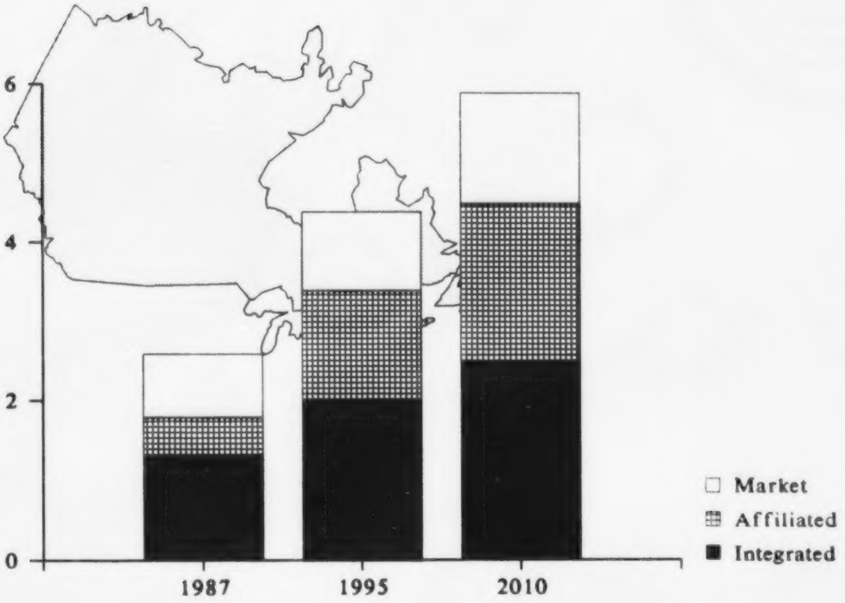
While it is unlikely that significant new incremental capacity in BKP will occur in Canada, there are situations where the addition of new pulp mills will make sense. One is the affiliation of a hardwood-based mill with existing or planned printing and writing paper capacity. Another is the inclusion of hardwood pulp production in an existing mill, either in addition to and/or in place of some of the BSKP capacity. Alternatively, the addition of market CTMP mills in locations with relatively low energy costs has a promising future.

Analysis of Markets

Canada

The printing and writing section of this report indicates Canada could consume over 2 million additional tpy of BKP by 2010. Much of this increase will be achieved by on-site integration of BKP producers, with most of the remainder achieved through various forms of affiliated shipments (Figure 7-19).

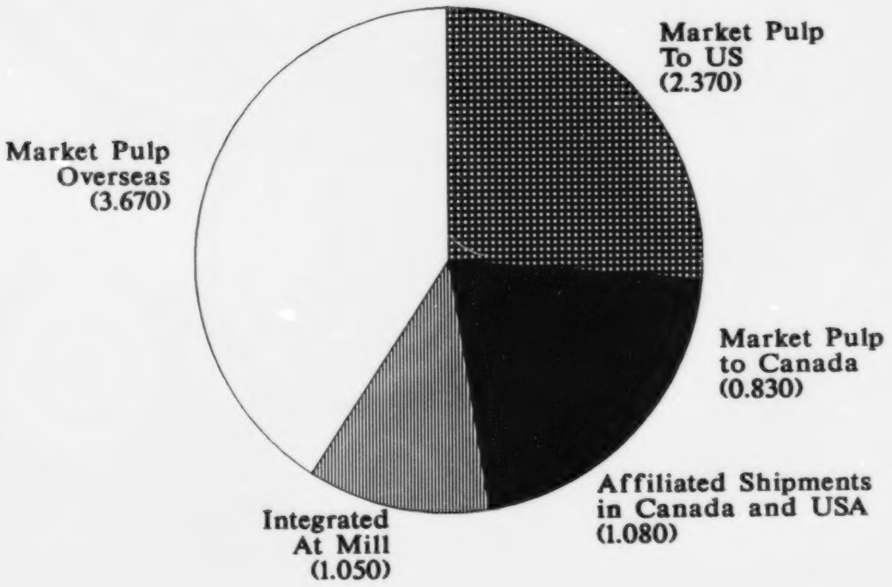
Figure 7-19
BKP Consumption in Canada
Current & Forecast
(millions of tonnes)



Source: WRA, CPPA

Canada has enormous BKP capacity, the majority of which is now exported as market pulp (Figure 7-20).

Figure 7-20
Distribution of Canadian BKP
1987
(thousands of tonnes)



Total: 9.000

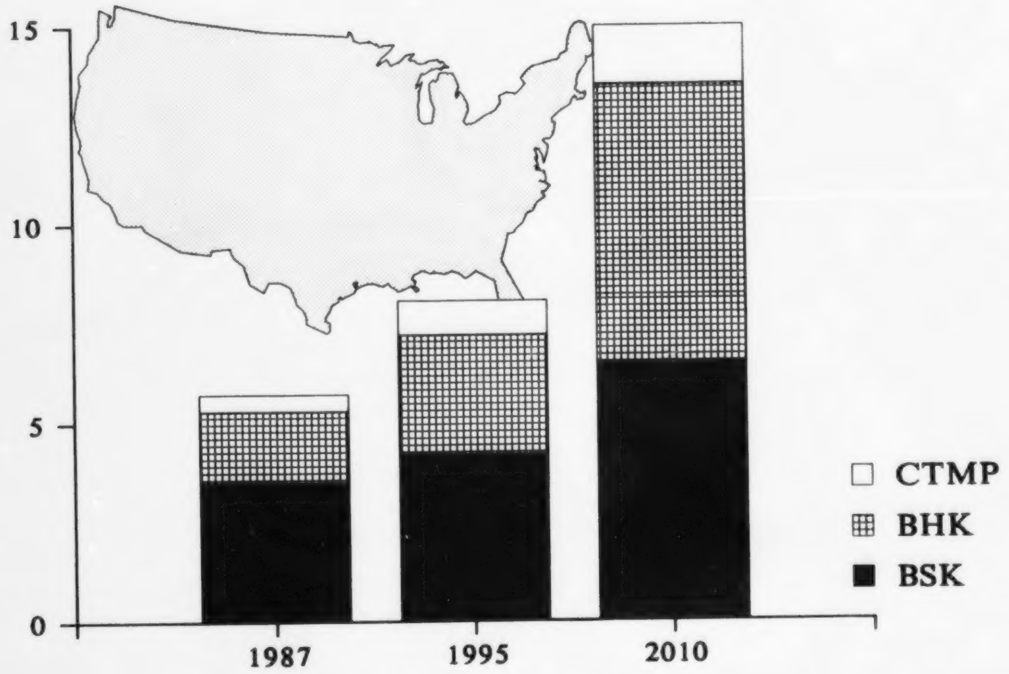
Source: CPPA

BKP market pulp shipments within Canada in 1987 were just over 830,000 tonnes which is a relatively small portion (12%) of total shipments. Over 1.0 million tonnes was used in Canada at integrated facilities, and a similar quantity was shipped to affiliates within Canada and the US.

United States

The US provides the best prospect for most Canadian market pulp producers. The opportunity will be more related to acquisition opportunities and the provision of affiliated arrangements for current market pulp. This is because of the large number of nonintegrated paper and paperboard mills that will need pulp supply security. Also significant, however, is the forecasted demand for BHKP (Figure 7-21), which is being driven by growth in US printing and writing paper demand. Canada's underutilized hardwood resource could be used to satisfy this expected demand.

Figure 7-2
U.S. Consumption of Dried & Transferred Pulp
Current and Forecast
(millions of tonnes)



Source: API

Growing corporate concentration in the US paper and paperboard industry, however, is providing fewer opportunities for market pulp producers to sell to nonintegrated paper and paperboard manufacturers. Some of the significant merger and acquisition activity is listed in Table 7-3.

Table 7-3
Major Acquisitions in the North American P&P Industry 1976-1987

Year	Company Acquired/Merged	By
1988	Great Lakes/CIP	Canadian Pacific
1987	Southwest Forest	Stone Container
1987	Port Huron Paper Co.	E.B. Eddy
1987	James River, Port Angeles	Daishowa
1986	Container Corporation (Mobil)	Jefferson Smurfit
1986	Abitibi (Smooth Rock)	Waferboard Corp.
1986	Hammermill	International Paper
1986	Crown Zellerbach Paper	James River Corp.
1986	Publishers Paper	Jefferson Smurfit
1985	Prince Albert Pulp Co.	Weyerhaeuser
1985	BCFP	Fletcher Challenge
1985	Westar Skeena Kraft	Repap
1985	Castlegar Pulp Mill	Consolidated Bathurst /CITIC
1984	Newton Falls Paper	Stora Kopparberg
1984	St. Regis	Champion Int'l.
1983	Harding - Jones Paper Co.	Simpson Paper Co.
1983	Sorg Paper Co.	Mosinee Paper Corp.
1983	Continental Group	Stone Container
1983	Port Huron Paper Co.	Pentair Inc.
1983	Diamond Int'l Pulp & Papermaking assets	James River Corp.
1982	Crown Forest	Fletcher Challenge
1979	Bergstrom Paper	P.H. Glatfelter
1979	Hudson Pulp & Paper	Georgia-Pacific Corp.
1979	Bodcaw Co.	IP Co.
1978	Appleton Papers	BAT
1978	Southland Paper Mills	St. Regis Corp.
1977	Horner Waldorf	Champion Int'l
1977	Blandin	BCFP
1976	Oxford Paper	Boise Cascade Corp.

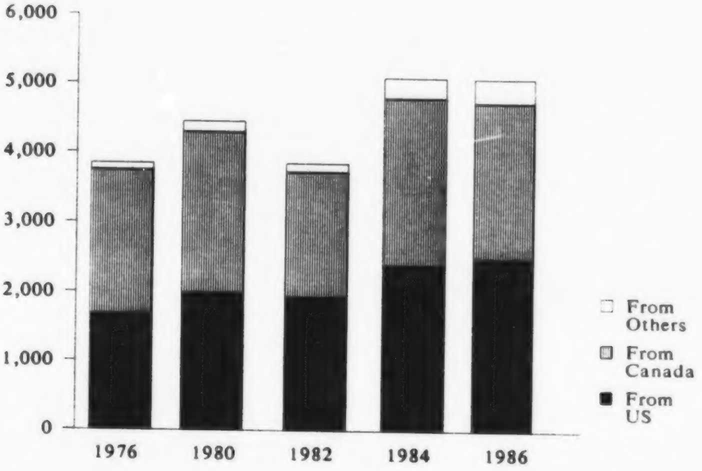
Integration

Company	Location	Pulp Grade	Paper Grade
Weyerhaeuser	Prince Albert, Sask	BSKP, BHKP	UFS
Georgia Pacific	Port Hudson, LA	BHKP	UFS
Bowater	Catawba, SC	BSKP, BHKP	LWC
Scott	Skowhegan, ME	BSKP, BHKP	CFS
Hammermill	Selma, AL	BHKP	UFS

Source: WRA database

Furthermore, many new mills and/or machines are now integrated on-site or use pulp from a corporate affiliate. This means that market pulp demand in the US has been relatively static for Canadian producers during the 1980s (Figure 7-22) despite paper and paperboard production increasing by over 10 million tpy. In 1976, Canadian shipments of all grades of market pulp to the US were about 2.1 million tonnes, rising to just over 2.3 million tonnes in 1987 (it should be noted that these tonnages do not include the affiliated categories).

Figure 7-22
Market BKP Supply - US
(thousands of tonnes)



Source: WRA, API

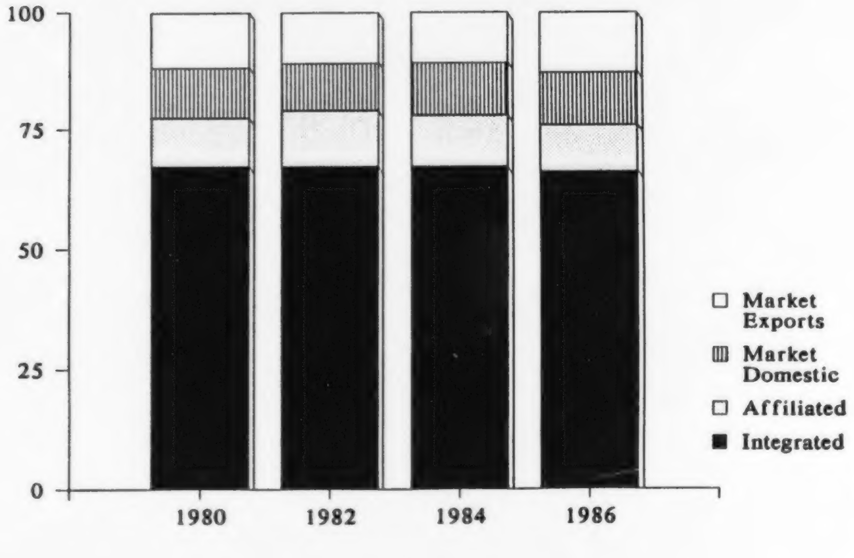
A considerable demand for market pulp will continue in the US, but increasingly, market pulp consumption will be limited to specialty grade or supplemental fibre supply during periods of peak paper and paperboard operating conditions.

By 2010 the US will require an additional supply of about 27 million tpy of paper grade pulp. Domestic integrated production is expected to supply the majority of this, but the demand for dried and transferred pulp will continue to increase (Figure 7-21). This will provide ongoing opportunity for Canadian BKP producers, especially BHKP, and also CTMP for use in tissue and towelling as well as printing and writing grades. It is impossible to predict how the additional requirements for paper grade pulp from Canada will be divided between market or affiliated shipments. It is our opinion that the majority will be in the latter category.

Production and Trade

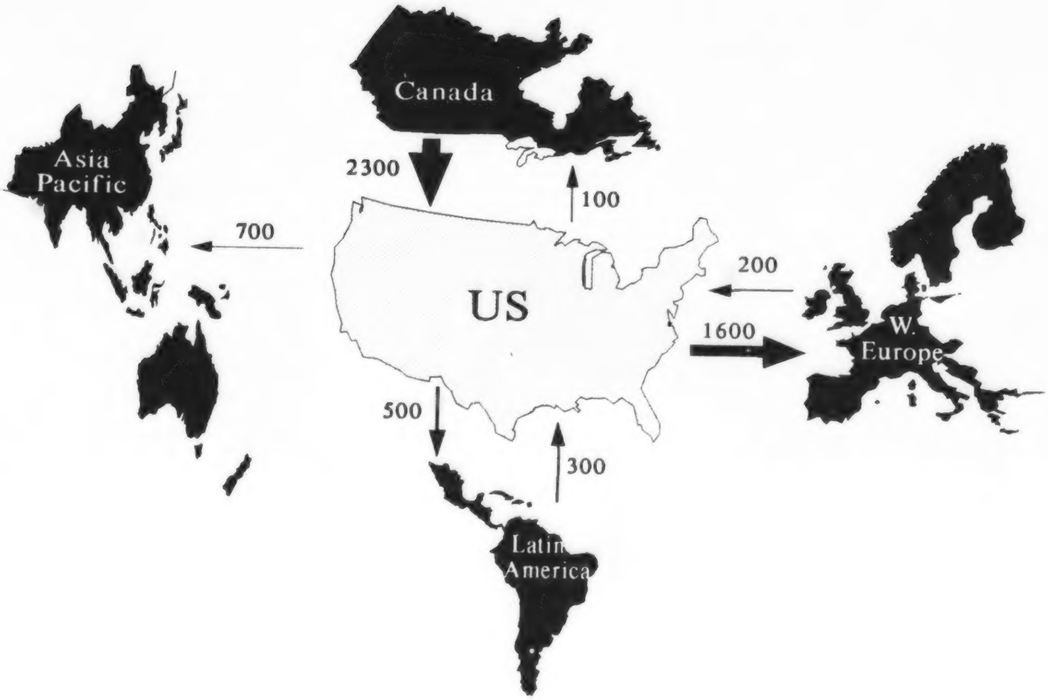
Production of white chemical pulp (WCP) in the US is largely at integrated operations (Figure 7-23) which supply about two-thirds of the total consumption. Imports and exports of pulp to and from the US are balanced, as shown in Figure 7-24.

Figure 7-24
US White Chemical Pulp Production
Degree of Integration



Source: WRA, API

Figure 7-24
US Market BKP Trade 1987
(thousands of tonnes)


Canada
Asia Pacific
2300
100
700
US
200
1600
W. Europe
500
300
Latin America

Source: WRA, CPPA & API

US demand for fibre will result in greater domestic use of pulp and a lower proportion of exports than at present. Imports are expected to continue in response to the ongoing need for more specialized pulps referred to above.

The issue in the US market, however, is not the quantity of pulp likely to be traded, but rather the ownership structure under which an exchange of pulp will occur.

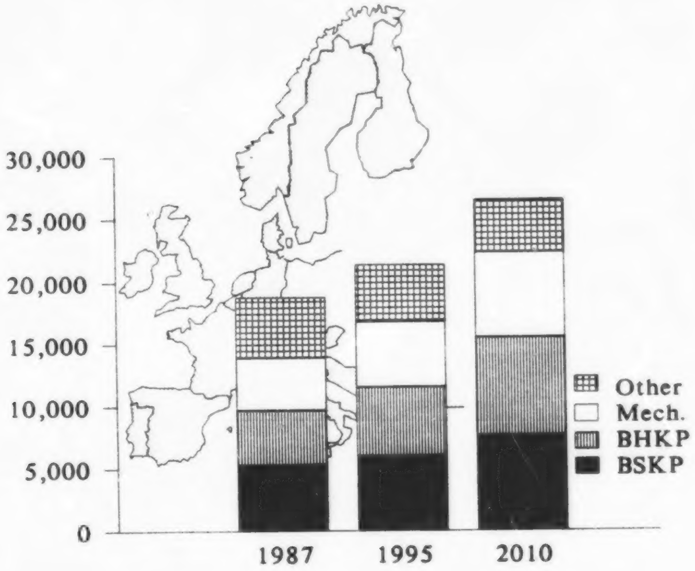
The changing ownership structure through increased corporate concentration in the US is leaving even fewer independent paper producers. This will result in US-based companies looking elsewhere for acquisition opportunities to secure a supply of pulp for their operations. Companies such as James River Corporation, Pentair, and Consolidated Papers are all major buyers of market pulp at present and could become potential partners for affiliated supply.

South American market pulp producers are expected to increase their US market share. Investment and debt problems have inhibited development of pulp production facilities in the Latin American regions suited to plantation silviculture. These problems will likely be overcome and the competitive cost advantage of pulps from this region will undoubtedly lead to significant capacity increases.

Western Europe

The majority of the production of paper and paperboard by nonintegrated producers makes continental Europe the world's largest regional market pulp consumer. Europe will provide ongoing opportunity for market BKP, and Canada will remain a major participant. However, product specifications will become increasingly stringent and will focus increasingly on hardwood (Figure 7-25).

Figure 7-25
Western European Consumption of Market Pulp
Current and Forecasted
(thousands of tonnes)



Sources: EPI and RISI

European papermakers are becoming increasingly aggressive in their international marketing strategy. They realize the need to protect their profits by obtaining a wider currency averaging system, and know they must ensure broader market access for their large-scale production capacities.

The Nordic pulp and paper industries have intensified their forceful drive to concentrate and unify national efforts in order to achieve the highest degree of competitiveness with the assets and resources at their disposal. In Sweden this has led to the rapid evolution, by mergers and acquisitions, of three major Groups which now effectively control the country's industry (i.e. Stora, SCA, and MoDo). Kymmene/Schauman and the Metsa-Serla Group are part of the contraction of the once numerous Finnish mills. The basic objectives are to achieve the necessary mill and machine sizes, synergistic R & D, and marketing strength to maximise trading opportunity primarily in Europe, but also to an increasing degree internationally. Assisted by downstream integration of paper and board distribution outlets in Continental Europe, the Nordic presence will be increased even further in the EEC. These include ownership of papermaking facilities (Norland, Star, Shotton, and Thames Board), joint ventures in Europe (SCA-PWA, Holmens-MD), downstream integration of distribution channels (Modo and SCA), and EEC involvement in Nordic pulp production (Feldmuehle-Norrsundet).

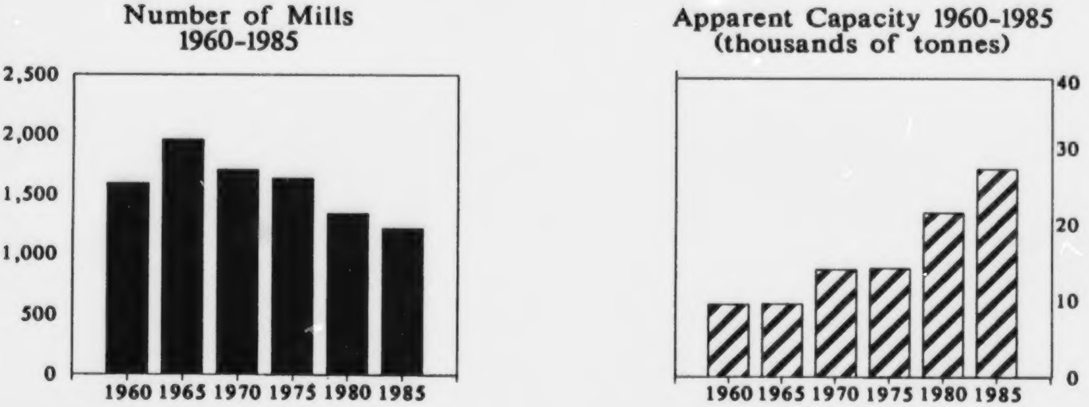
Both the Swedish (SCPF) and Finnish (Finncel) Pulp and Paper Associations (SCPF) are vigorous and outspoken in their support of the national goal, especially towards the challenges which will occur in 1992 when the EEC abolishes tariffs. In the 1987 SCPF annual report, the Director General closes his comments as follows, " Only first class enterprises, big or small, can compete with success on the European market against other materials and against keenly competitive exporters of other continents."

Canadian market pulp suppliers will be faced with further erosion of the number of nonintegrated/affiliated customers, which will affect their distribution strategy in the opportunities presented by increases of European paper and board consumption.

The national European paper industries are collectively becoming large, and the ongoing wave of mergers and acquisitions (e.g. Feldmuhle/Begin, Haindl/Parenco, Wiggins Teape/Soporcell, and the Italian reorganizations) demonstrate their recognition of the need for structural change and a determination to survive and prosper. An assured and long-term supply of market pulp is imperative for their success and Canadian suppliers will continue to maximize and even increase their participation in meeting this need.

There has been a dramatic drop in the number of small independent paper and board producers in Europe (Figure 7-26). Until the early 1970s the industry was characterized by a large number of relatively small facilities, many family operated, catering to specialty and mostly local markets. The average capacity of Western European paper machines, which was 20,000 tpy in 1965, has risen to about 100,000 tpy. Few of the smaller companies could withstand the vigorous Nordic reorganization, and the elimination of national protectionism with the advent of the EEC. In effect, Europe became one large marketplace for paper and paperboard, and Nordic astuteness made sure the EFTA access was progressive both in regard to reducing tariffs and shortening the time for this reduction.

Figure 7-26
Structure of West European Paper and Board Industry
(Number of mills and productive capacities)



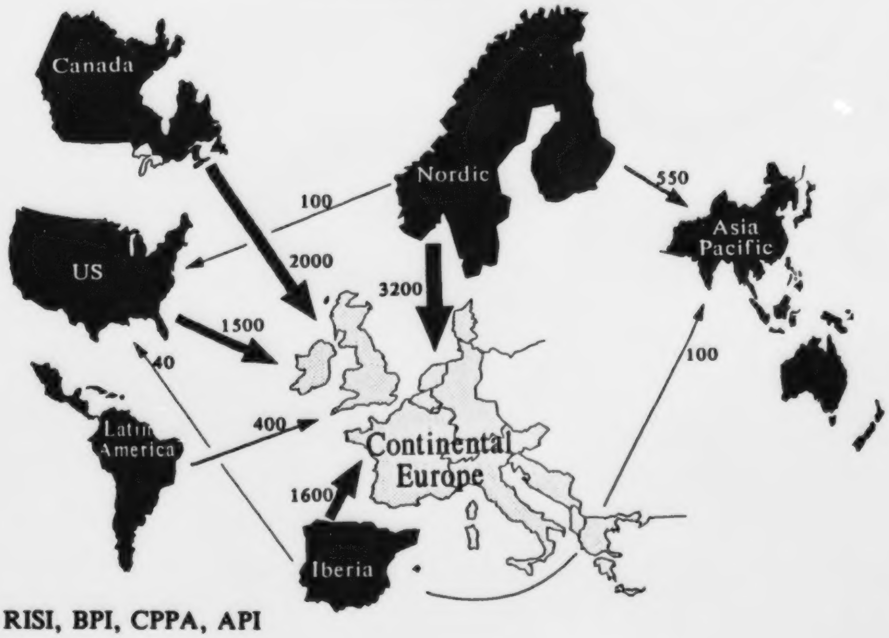
Source: CEPAC

Continental Europe relies heavily on pulp imports from a wide variety of producing regions to supply its substantial paper and paperboard industry (Figure 7-27). The Nordic countries will continue to supply high quality grades of market pulp. However, the established European paper and paperboard producers will have to purchase most of their incremental supplies from elsewhere. In order to compete successfully with Nordic paper producers, EEC domestic producers will direct as much of their pulp purchases as possible to the lower cost supply sources.

In 1987, European mills produced 35.8 million tonnes of paper and board, and the Nordic countries 17.4 million tonnes, for a total of more than 53 million tonnes. European paper and paperboard producers imported more than 10.9 million tonnes of pulp in 1987 to furnish their production requirements.

The forecast is for this 53 million tonnes of paper and paperboard production to increase to about 85 million tonnes by 2010. Even allowing for the high proportion of waste paper used in Europe (45-50%), and increases in filler components, an additional 15-20 million tonnes of paper grade pulps will be required to meet the forecast levels of production.

Figure 7-27
Western Europe Market BKP Trade
(thousands of tonnes)



Sources: RISI, BPI, CPPA, API

The national European industries have limited ability to become more integrated in pulp and paper. There are plans to expand and upgrade French and Iberian market pulp capacity but otherwise there is little expectation of more domestic pulp. Any Nordic contribution will be modest in relation to the extent of the demand increase.

Western Europe, more than any other region of the world, exemplifies the dilemma of a dwindling supply of "easy to exploit" fibre. The ramifications of this could well mean a buoyant future for market pulp suppliers.

But there is an alternative scenario. This is one in which fundamental forces alter the structure of the pulp and paper industry, as Western European manufacturers strive to secure their pulp supply through affiliated arrangements--contributing to the "thin market" phenomenon. The future is likely to produce increasing pressure from Europe for ownership of, or affiliation with, Canadian pulp mills. But the Canadian industry does not need to relegate itself to the role of pulp supplier.

Canadian pulp producers will increasingly recognize the strategic value of the fibre which remains in the country and is integrated into paper production. Alternatively, Canadian producers might invest in new nonintegrated facilities in Western Europe. However, the established European paper industry is likely to resist attempts to allow local capacity to slip farther from their control. Also, the nontraditional pulp sources which are becoming increasingly available are likely to dominate the future pulp supply picture.

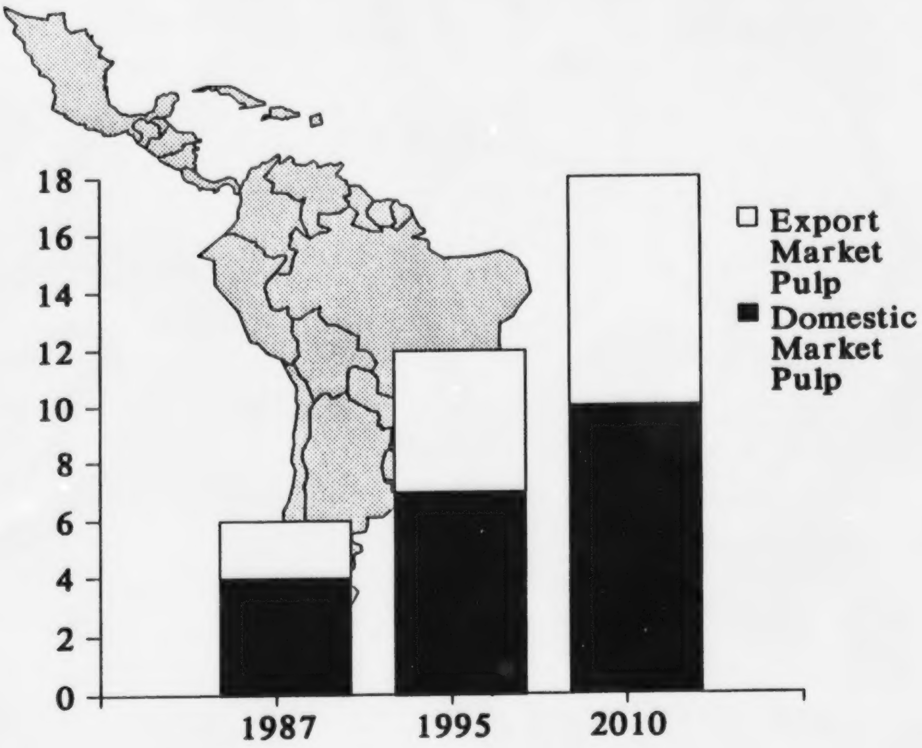
Therefore, in spite of dramatically increasing demand for "dried and transferred" pulp to Western Europe, there will be limited attractive long-term opportunities for Canadian suppliers. The divergent objective of some Canadian pulp producers and European paper producers may conflict in regard to a continuing presence in the supply of market pulp. The volume will likely remain more or less static but with a shift from the primarily BSKP mix towards BHKP and mechanical pulps.

European papermakers (including the Nordic countries) are leaders in the use of mechanical pulp for communication papers, providing a market-led opportunity for Canadian producers who will direct investments toward market mechanical pulps.

Latin America

Latin America, in this context, is viewed as a competitive supply region rather than a market opportunity (Figure 7-28).

Figure 7-28
Latin America - BKP Production
Current & Forecast
(millions of tonnes)



Sources: National statistics, RISI

Except for Venezuela and Mexico, imports of pulp to Latin America are negligible and cannot be considered as a meaningful prospect for future sales. There might be some demand elsewhere for modest amounts of northern fibre for specialty uses, but the regional strategy will be to maximize indigenous fibre.

Venezuela and Mexico have doubled their imports of paper grade pulp to more than 550,000 tpy since 1983, with 75% being supplied from the Southern US. Both countries have their own forest resources, but these are insufficient to support the growth of demand. Canada is currently shipping about 140,000 tpy. Because of freight advantages, the US will remain the preferred supplier, coupled with the fact that southern pine is a similar species to their local softwoods. Greater availability of Chilean radiata pine and eucalyptus will also attract pulp buyers from the northern countries of this region.

The outlook for the development of an increased supply of BKP from Brazil, Argentina and Chile was covered earlier in this analysis and clearly poses a serious competitive threat to the historical dominance by Norscan producers, especially in relation to BHKP. However, local demand in Latin America for pulp will also increase due to the rapid growth in paper and paperboard consumption, and will likely inhibit the availability of export tonnages to some extent.

Financing in Developing Countries - The Problems of Insurmountable Debt Loads

A key variable in the development of the forest products industry in Latin America (as well as other developing countries) will continue to be project financing difficulties under existing high debt loads. The recession of the early 1980s has left these countries more deeply indebted than ever to the major money markets in Europe, US and Japan. The inability of most of these countries to even meet the payment terms for interest on their loans, let alone make reductions to the ever mounting principal, has resulted in a serious re-evaluation of guidelines to assess potential loans to these countries by foreign moneylenders.

This has been exacerbated by the fact that the US, traditionally the largest lender to developing countries, has become increasingly burdened in foreign debt problems of its own.

The pre-1980s theory assumed that inflationary growth and projected expansions of world markets beyond the end of the century would provide the vehicle for development and absorption of the developing countries' growth in facilities, trade and financing requirements. It was projected that inflation would allow payback of the development loans with no major hardships to either the loaning or the debtor countries.

Confidence in this theory has been severely shaken, and at least, substantially deferred by the progress so far in the 1980s. The wounds of the deep world recession suffered by many "traditional financiers" have left a lasting mark on these institutions which only time and close control of new financings will heal.

Under this context, Latin American countries such as Argentina, Brazil and Chile, are likely to find a much less sympathetic ear to requests for financing of new major projects such as pulp and paper mills.

In addition, pulp and paper expansion projects will have to vie for available capital with many other projects in the developing countries, (for example manufacturing industries such as machinery, computers, automobiles, footwear, textiles, clothing, and mining ventures, as well as agricultural products). All of these products have become viable options for developing countries with ample low cost labour and raw materials. They will all require substantial capital financing. The question becomes: which projects will be financed and which will not?

An example of the current investment tone is the restructuring of debt in Brazil, one of the countries with the greatest forest products potential. In 1986, Brazil registered strong economic growth for the third consecutive year. Real GDP expanded 8.2%, mainly due to the new Cruzado plan which was announced on February 28, 1986. In Sao Paulo State, 330,000 industrial jobs were created in 1986 and the 400,000 jobs lost since the 1982-83 recession were fully recouped by the end of the 1984-86 period. However, exports declined, with the trade surplus decreasing from US$12.8 billion (1984-85) to US$9.5 billion. Consequently, despite the adoption of these measures, Brazil's economic situation became unsettled and interest rates returned to the pre-Cruzado plan levels (about 400% by the end of 1986). Rates escalated even higher in 1987. In February 1987, the year-old price freeze was lifted and prices of many goods immediately jumped 30 to 50%.

Dried-up capital flows, a decreasing level of reserves and steady deterioration of the trade balance resulted in an increasingly untenable debt servicing situation. Therefore, the Brazilian government suspended interest payments on approximately $68 billion of medium and long-term debt with commercial banks. This prompted many foreign banks to reduce, or not renew, very important short-term lines of credit used by Brazilian businesses to finance foreign trade operations.

Despite the fact that to date in 1988, Brazil has been restoring traditionally good relations with commercial bank creditors by resuming interest payments and restructuring debt, foreign banks will be viewing any new borrowing requirements for longer term financing very closely and, in all likelihood, attaching interest rate premiums to any loans granted.

With no immediate outlook to solve the problem of reducing or eliminating this enormous debt load, a considerable question mark is placed on the tremendous amount of capital which will be needed to finance development of the forest products potential for these countries, in spite of the fact that they possess some of the lowest cost fibre resources.

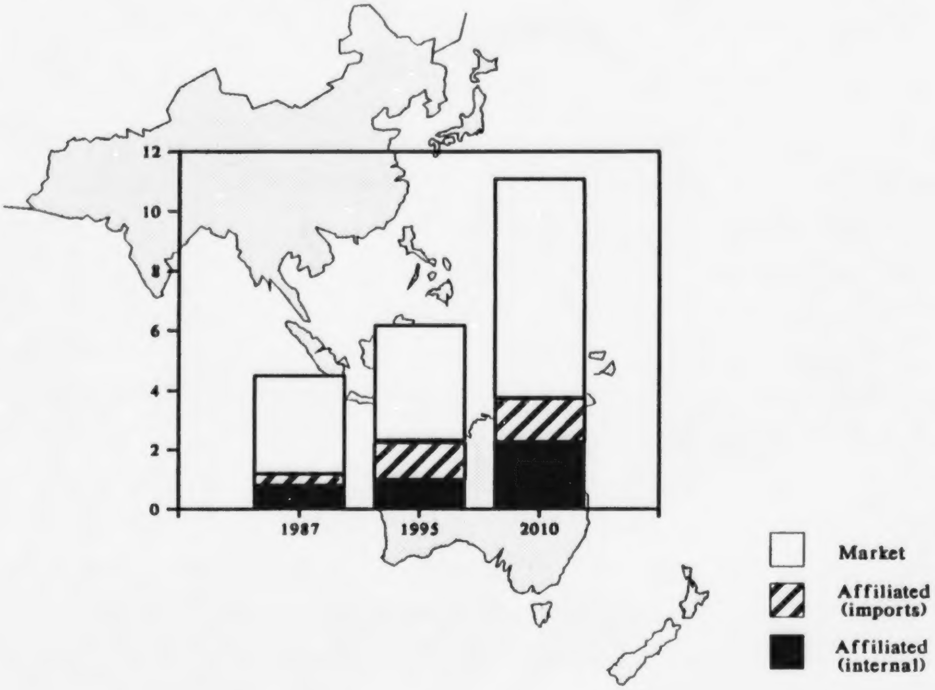
The Brazilian government will continue to have problems financing new pulp and paper developments on its own. As a result, investments will be heavily weighted to joint ventures and infusions of investment by companies willing to invest in pulp and paper production which will be available for their use as an affiliated or integrated producer (e.g. Champion, M.B., Abitibi, Consolidated, Stora, Oji). Successful loan applications for the pulp and paper industry will need to seek out newer sources of financing such as mergers, joint ventures, debt swaps, etc. Only under these relatively new tighter loan control or direct participation conditions, will foreign investors be more guaranteed of receiving a payback on their investments and more willing to invest the large amounts of required capital.

Asia-Pacific

Regional Supply

Asia-Pacific has been and will continue to be a net importer of pulp (Figure 7-29). It is expected that additional market pulp supply will emerge from New Zealand and Australia in the 1990s but this will only partially satisfy increased demand for market pulp requirements in the region.

Figure 7-29
Asia-Pacific - Pulp Consumption
Dried and Transferred
(millions of tonnes)



Source: WRA, IPPA, API

New Zealand currently exports about 200,000 tpy of market pulp, divided almost equally between BSKP and UKP. Two mills are involved in production, with most of the tonnage being directed to Australia and the balance to various countries in S.E. Asia. A well directed plan of forestation will begin to provide adequate fibre for increased pulp and paper production in the latter part of the 1990s. By that time, a wood source for over one million tpy of radiata pine BSKP will be available. The potential for additional market BSKP and/or integrated production is formidable.

Australia presently has limited pulp production capacity and is a net importer of pulp. National industry development strategy includes a drive to self-sufficiency and pulp export, by the utilization of natural eucalyptus and also expansion of plantation eucalyptus and softwoods. Studies are also underway for development of bagasse and other nonwood fibre pulp. In the period under review, it is probable that local pulp will eliminate the need for imports of Canadian, US and Nordic pulps, and a reverse flow of eucalyptus pulps could emerge with the planned new capacity.

Approximately 900,000 tpy of market pulp is presently produced in Taiwan, Indonesia and South Korea. The latter two countries use all of their output in the domestic market, and Taiwanese exports are limited to about 100,000 tpy. South Korea is proposing to double its present capacity of BSKP/BHKP products to 300,000 tpy. It is also reported that a South Korean group is investigating pulp production in North America.

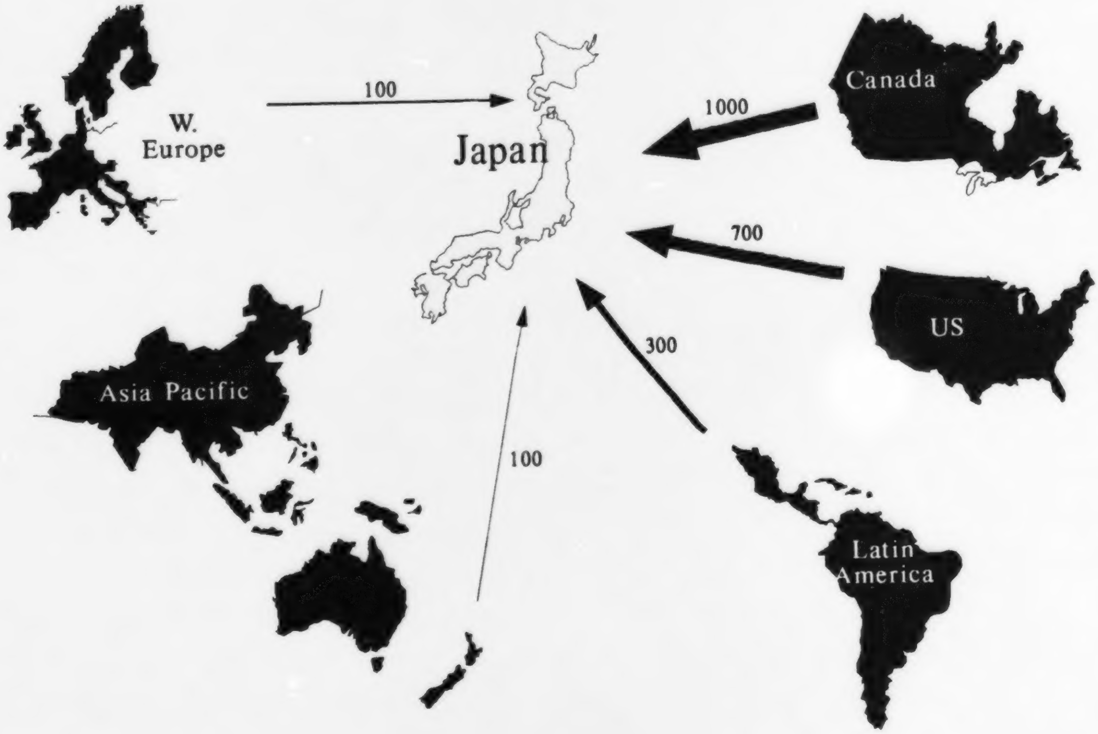
Further extension of the pulp and paper sectors in the Pacific Rim region will require resolution and action by national governments and industry. To date, there is little evidence of this and there will be no meaningful development of pulp capacity which will reduce the dependence on imported pulp from traditional sources, until at least the end of the century.

However, because of the need to reduce raw material import costs, Latin American sources will be favoured and will be the primary competitor to Canada in the Asia-Pacific region.

Japan

The sophisticated and strong Japanese paper and paperboard industry continues to grow. The current focus of GDP growth on the domestic economy will result in ongoing increases in annual production, which reached yet another record of 22.6 million tonnes in 1987. As a result, market pulp imports were more than 2.6 million tonnes, up one million tonnes over 1980 imports. Canada supplied 40% of this amount, mostly as BSKP, with the US being the next major supplier with a 30% share. Nordic influence in the market is negligible (Figure 7-30).

Figure 7-30
Japan Market BKP Imports 1987
(thousands of tonnes)



Source: WRA, JPA, CPPA & API

Japan is the world's fourth largest pulp producing country, and for as long as possible has striven to maintain its independence from imported pulp. Despite predictions that domestic paper grade pulp production would decline following the mid-1970s recession and because of environmental concerns, it has continued to expand and now exceeds 9.5 million tpy. Although recent annual pulp production increases have been small, the carefully planned campaign to secure chips and logs from overseas sources has been able to provide the required pulp furnish and has also helped to prolong the availability of domestic wood resources.

Because of extremely favourable currency exchange rates, the escalation of BSKP prices by more than $300/tonne in the past three years did not result in an increase of pulp costs in yen terms for the Japanese papermaker until the most recent increase (in the third quarter of 1988). (The current price of just over 100 ¥/kg compares to 98 ¥/kg in 1985 at 116 ¥/kg in 1984.)

By 1995, market pulp imports will rise to approximately 3.5 million tpy, of which the Canadian share will probably be close to 1.5 million tpy. During this period, major Japanese companies will be engaged in either building or negotiating for pulp production facilities throughout the world. The strength of the yen enhances investment in foreign countries (especially in North America), uses capital more efficiently, and provides lower cost pulp than is possible from a new domestic mill.

Faced with the prospect that annual paper and paperboard consumption will likely reach 38 million tonnes by 2010, the Japanese industry has once again embarked on a national strategy to ensure that the domestic industry produces as much of this volume as possible (we are forecasting 35.5 million tonnes). Pulp will still be available from domestic sources, and the balance imported as affiliated and/or market dried pulp.

It is expected that domestic production will increase by approximately two million tonnes over the next 20 years. This assumes there will be increased availability of domestic hardwoods, and that Japan will be able to purchase large incremental volumes of imported chips at the same time as increasing pulp imports, either affiliated or market. At least four million tpy of additional dried pulp will be required by 2010. Some of the incremental supply will come from Canada, especially BHKP and CTMP, but the extent will depend on the Canadian industry's strategy in relation to integration versus expanding market pulp product, as mentioned earlier.

Imports By Other Pacific Rim Countries

Growth of market pulp demand in this diverse region has been generally good. The increased annual rates of growth in paper and paperboard consumption are expected to continue, although in some densely populated countries such as the Philippines and India, progress will be slow due to political difficulties and until economic progress permits development of the paper and paperboard industry. It is difficult to predict when this will take place.

South Korea is the region's dominant market pulp importer, purchasing close to 700,000 tpy, of which 250,000 tpy is from the US and 140,000 tpy from Canada. Korean paper and paperboard production is expected to double from its present three million tonnes annual capacity to more than six million tonnes by the turn of the century. Increased paper and paperboard production will rely primarily on additional pulp imports. Demand will focus on hardwoods and supplies from low cost sources, with an increase of more than one million tpy by 1995 and two million tpy by 2010. An opportunity will exist for Canadian producers to supply an additional 200,000-300,000 tpy if they have the tonnage available.

Taiwan, with an output of more than two million tpy, is the other major paper and paperboard producer in the Pacific Rim. Imports are limited to about 200,000 tpy at present, but this will increase to 400,000 tpy at the turn of the century, in order to furnish Taiwan's planned growth of paper production.

Demand for market pulp in other Pacific Rim countries in this region is now approximately 800,000 tpy, with the US and Canada each shipping about 250,000 tpy and the Nordic countries 140,000 tpy. There is potential to increase these volumes to the year 2000, but the extent will depend on the success of national development of indigenous wood resources and also the availability of increased volumes of nonwood fibres such as bamboo, straw and bagasse. Also, despite high expectations and positive forecasts of increased production of paper and paperboard for this region, expansion is painfully slow in the countries with dense populations. Priority for increased consumption of pulp will be to use the indigenous fibre, then imports from low-cost supply sources, and finally from Norscan countries.

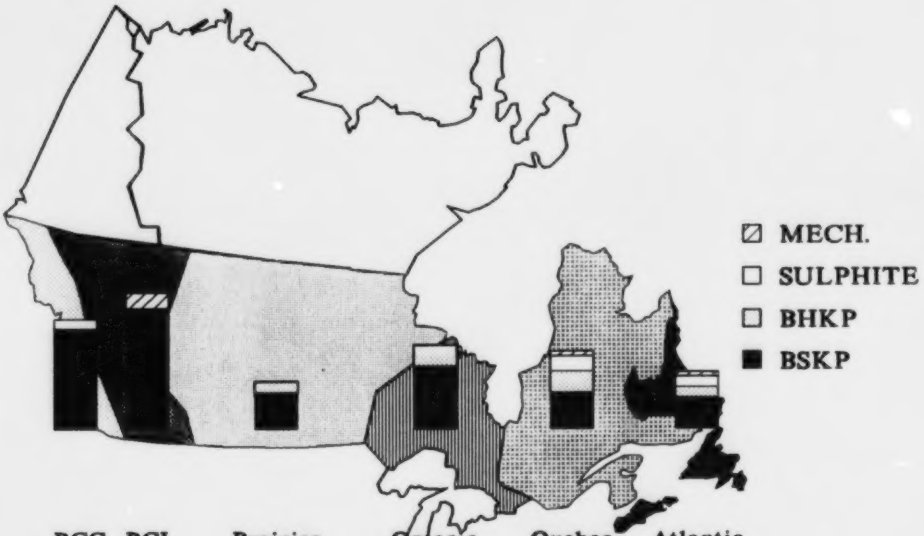
The reality of industry development priorities in the People's Republic of China has dampened the high expectations of Canadian and other world market pulp suppliers for increased sales. Even though paper and paperboard production has made much progress in the past 15 years, and now exceeds 10 million tpy, there is no evidence at this time of major new capacity which will require large increases of pulp imports. The imperative of preserving foreign exchange, the apparent low priority given to the pulp and paper industry in the allocation of capital funds (e.g. versus energy and communication) and the continuation of dependence on domestic nonwood fibres has precluded a repetition of the 1983 banner year when imports were roughly 700,000 tonnes, of which 330,000 tonnes came from Canada. Annual sales by Canada since then have fluctuated, but have averaged less than 300,000 tpy. This level will increase slowly, but we believe it is premature to anticipate major increases in demand for market pulp until there is evidence of long-term strategic change for the paper and paperboard industry.

Canadian Market Pulp Industry

The Canadian market pulp industry is characterized by a high orientation to BSKP especially in BC, where there is currently no hardwood production. BC also produces almost 50% of the dried and transferred pulp for all of Canada (Figure 7-31).

While mechanical pulping in Canada is highly integrated with newsprint, by contrast, chemical pulp is mostly market or affiliated (Figure 7-32). Canada is much different than the US in this respect and more comparable to Latin American and Swedish suppliers (Figure 7-33).

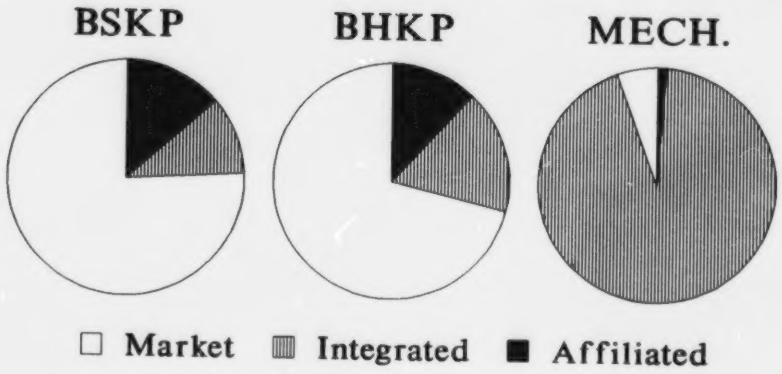
Figure 7-31
Overview of Canadian Pulp Industry by Region
Dried and Transferred Pulp Shipments 1987



	BCC	BCI	Prairies	Ontario	Quebec	Atlantic
# of Mills	9	7	3	8	8	4
Capacity (million t)	2.4	2.1	0.7	1.9	1.9	0.8
Market/Affliated Pulp	2.1	2.6	0.9	1.6	1.6	1.1

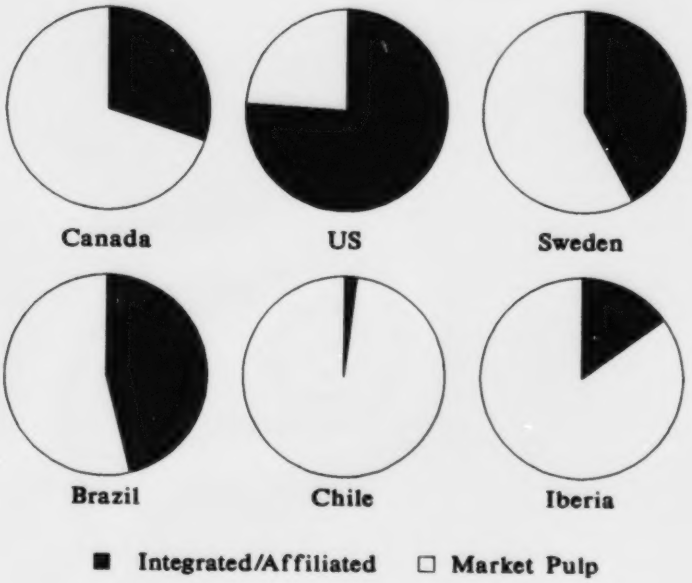
Source: WRA database, CPPA

Figure 7-32
Canadian Pulp Industry
Distribution of Production in 1987



Source: WRA estimates

Figure 7-33
Degree of Integration
Major BKP Producing Regions



Source: WRA estimates based on International Statistics

We will, in the following analysis, show that Canada is a high cost producer compared to the plantation wood based regions like Brazil and Chile and is, therefore, vulnerable in weak market conditions.

BC Coast

There are 10 mills on the BC Coast, ranging in size from 150,000-420,000 tpy capacity (Table 7-4). Most of the mills produce BSKP and were built in the 1960s/70s; some are of pre-WWII vintage. There has been ongoing upgrading and debottlenecking over the years, and some major rebuilds. In the past two years, there have been large investments by most companies to increase productivity and to meet environmental requirements. Capital expenditures are up sharply in 1988, with some investments continuing for several years.

Table 7-4
Pulp Mills - BC Coast

Mill/Location	**Capacity** thousand tpy	**Grades**
Repap, Prince Rupert (3)	420	BSKP
MB, Harmac	360	BSKP
BCFP, Crofton **	340	BSKP
Crown Forest, Elk Falls **	350	BSKP/UKP
CIP, Gold River (2)	250	BSKP
Canfor, Howe Sound (1)	220	BSKP
Western Pulp, Woodfibre	220	BSKP
MB, Powell River **	180	BSKP
MB, Alberni **	260	SBSKP/UKP
Western Pulp, Port Alice	150	DISS/SULF
Total	**2,750**	

** Integrated newsprint mill.

(1) A major rebuild of the Canfor Port Mellon mill will increase pulp capacity by 1990, some of which will be integrated with a new joint venture newsprint operation.
(2) A new newsprint machine is under construction as part of the CIP complex at Gold River.
(3) 45,000 tpy of additional capacity from Repap's mill in Prince Rupert is coming on stream in 1988.

All of the mills have deep sea berths, and thus enjoy a notable cost advantage for offshore shipments. In contrast, freight costs for delivery to the Eastern and Midwest US market are high, and as a result relatively small volumes are shipped to North American mills.

There are distinct differences in the species and growth conditions of the fibre on the BC Coast. Wood is supplied primarily from sawmill residues and consists of hemlock, Douglas fir, cedar and also SPF mixtures from the southern interior. In the past, most of the pulp produced in this region was in commodity grades, with production being largely dictated by available chips from corporate group sawmills.

Four of the coastal mills are also major newsprint producers, and thus have the advantage of integrated pulp supply. The remainder are committed to international pulp markets, with four of the producers having some affiliation with paper and paperboard producers.

BC Interior

The 10 mills in the BC Interior were all built in the late 1960s and early 1970s except one built in 1960 (Table 7-5). All are relatively modern, although most are below the current world economy of scale (300,000 tpy +). Several lack power cogeneration. In recent years there have been some major investments, with one mill doubling its size.

Table 7-5
Pulp Mills - BC Interior

Name of Mill	Capacity thousand tpy	Grades
Northwood, Prince George	480	BSKP*
Weyerhaeuser, Kamloops	440	BSKP*
Canfor, (P.G.P.P.) Prince George(1)	280	BSKP/UKP
Canfor, (Intercont.) Prince George	240	BSKP
Cariboo, Quesnel	270	BSKP*
BCFP, Mackenzie	210	BSKP/UKP*
Celgar, Castlegar	200	BSKP*
Crestbrook, Skookumchuck	190	BSKP*
Quesnel River, Quesnel	200	TMP/CTMP*
Finlay Forest, Mackenzie	130	TMP*
Total	**2,640**	

* These mills have either joint venture or affiliated connections.

(1) Produces kraft papers.

The following changes to pulp capacity are underway or being studied:

1)	Cariboo	+50,000 tpy BSKP
2)	Quesnel River	+100,000 tpy CTMP/TMP
3)	Fibreco, Taylor.	Greenfield CTMP mill + 180,000 tpy
4)	Crestbrook	200,000 tpy expansion under study
5)	Finlay Forest Products	130,000 integration to newsprint (1989)

Wood supply, in the form of chips, is an integral economic component of the BC lumber industry and is supplied from a wide range of independent sawmills and integrated mills. Wood furnish is primarily in the form of SPF sawmill chips. Two species, western white spruce and lodgepole pine dominate the pulp furnish supply. The similarity in their fibre morphology permits a high standard of uniformity. As a result, market pulp from the BC Interior has a well established and good reputation in world markets.

The mills face a $US30-35 per tonne rail freight/terminal cost disadvantage to transport their products to coastal ports for export. As a result, about 40% of the shipments are directed to the North American market where freight rates to the US Midwest are comparable to offshore options. There is a substantial freight disadvantage to destinations in Eastern Canada and Eastern and Southern US.

All of the BC Interior mills are dedicated to market pulp with some having major affiliations in North America and overseas. It is estimated that more than 20% of the annual shipments are directed to affiliated mills. One mill operates a kraft paper machine on an integrated basis. Output is concentrated on BSKP and softwood TMP/CTMP, and as yet there has been no development of available hardwoods.

Prairies

The four mills in the Prairies were constructed between the late 1950s and the early 1970s (Proctor and Gamble's mill at Grande Prairie, Alberta), see Table 7-6. Until 1985 the three mills concentrated on using mixed softwood species to produce BSKP; since then some aspen hardwood has been used to produce BHKP.

Table 7-6
Pulp Mills - Prairies

Mill/Location	Capacity thousand tpy	Grades
P&G, Grande Prairie, AB[1]	260	BSKP/BHKP*
Weyerhaeuser, Prince Albert, SK[1] [3]	260	BSKP/BHKP*
Weldwood, Hinton, AB [2]	190	BSKP*
Manfor, MB	135	UKP
Total	**845**	

(see note 4)

* Affiliated tonnages shipped from these mills.

[1] The capacities of the Grande Prairie and Prince Albert mills are based on BSKP production. Both obtain higher yields using hardwoods.

[2] Weldwood is currently increasing BSKP capacity by 200,000 tpy (1989).

[3] A printing and writing machine has been installed.

[4] a) A greenfield CTMP mill started up in late July at Whitecourt producing 220,000 tpy (Millar Western).
b) A new greenfield mill is under construction to produce 400,000 tpy of BSKP/BHKP in Northern Alberta (Daishowa).

In recent years the government of Alberta has undertaken a vigorous program to develop latent forest resources, focused on hardwoods. Numerous projects have been studied and as a result a wave of expansions are either underway or being actively studied including newsprint, BHKP and CTMP mills. The activity is reminiscent of the BC Interior region in the mid-1960s.

Alberta will export some of its output offshore and these products will be subject to inland freight/terminal costs of $35-40/tonne. The preferred target for this region will be the US.

The mill in Saskatchewan produces both BSKP and BHKP, and in 1986 its sale by the provincial government was contingent on the construction of an integrated paper machine which will start up in the second half of 1988. Improvements and expansions to the pulp mill will allow continued shipments of market pulp, albeit at a slightly reduced volume.

The only mill in Manitoba produces kraft papers, with occasional small volumes of market UKP. At this time, it is the subject of takeover negotiations, and the mill may be converted to BSKP and/or BHKP production.

It is estimated that close to half of this region's shipments are moving to affiliated mills. About 80% of the market pulp movement is within North America, with the remainder being shipped to Japan and Europe.

Ontario

Ontario's seven pulp mills are generally older than the mills in Western Canada. The last greenfield mill was constructed in 1946. However, there have been several major upgrades and of the seven BKP mills in the province, three are approaching economy of scale size (Table 7-7).

Table 7-7
Pulp Mills - Ontario

Mill/Location	**Capacity** thousand tpy	**Grades**
Great Lakes, Thunder Bay[1]	460	BSKP
Kimberly-Clark, Terrace Bay	380	BSKP/BHKP
E.B.Eddy, Espanola [1] [2]	300	BSKP/BHKP
Boise Cascade, Fort Frances [1] [2]	180	BSKP
James River, Marathon [2]	150	BSKP/BHKP
Great Lakes, Dryden [1] [3]	130	BHKP
Waferboard, Smooth Rock Falls	100	BSKP
Total	1,700	

[1] Integrated on-site paper production

[2] Affiliated mills

[3] Great Lakes Dryden Mill is increasing paper capacity, and it is believed that most of the market pulp tonnage will be integrated.

The mills are favorably located with respect to comparative freight costs (rail or road) to the printing and writing paper manufacturers in the US Midwest. This advantageous position of Ontario market pulp mills is reflected in the fact that more than 90% of their shipments are to Eastern Canadian and US customers.

Six of the mills in the province are partially affiliated with other paper and paperboard mills, and four are integrated (paper). Another feature of the Ontario mills is that pulp trading between companies producing paper and paperboard is prevalent, and although it is not possible to isolate the tonnages from the reported market pulp sales, we feel they are substantial.

Quebec

There are now eight chemical and two CTMP market pulp mills in Quebec (Table 7-8). With one exception, the BSKP/BHKP mills are operated by major pulp and paper companies who either have on-site paper/board production or affiliations. This means that over 40% of production is either used on-site or shipped to affiliates.

Table 7-8
Pulp Mills - Quebec

Mill/Location	**Capacity** thousand tpy	**Grades**
Donohue St Felicien, St Felicien	300	BSKP
Domtar, Windsor [1,2]	280	BHKP
CIP, La Tuque [1,2]	260	BSKP
Domtar, Lebel-sur-Quevillon [2]	250	BSKP
Consolidated Bathurst, Portage-du-Fort [2]	220	BSKP/BHKP
Cascades, Port Cartier	180	CTMP
James Maclaren, Thurso	130	BHKP
Temcel, Temiscaming	120	CTMP
Tembec, Temiscaming	100	Diss
Cascades, Jonquiere [1,2]	70	BSKP
Total	**1,910**	

In addition to the above, Reed sells small quantities of BSP produced in excess of their newsprint requirements.

[1] Integrated on-site paper production
[2] Affiliated mills

Some of the market pulp mills in Quebec are relatively old, and require continual investment to remain competitive, especially regarding environmental regulations.

Annual shipment of dried pulp is about 1.3 million tonnes, of which close to 80% is sold in Canada and the US. Because of Quebec's reasonably favourable location for exports, 200,000 tpy is shipped overseas, mostly to Europe.

The major conversion from BSP to CTMP at Port Cartier will add 180,000 tpy of CTMP capacity by 1988, with the possibility of 90,000 tpy under consideration and/or a newsprint machine in the future.

Atlantic

There are seven market pulp mills in this region producing most grades (Table 7-9). Only one is solely dedicated to market pulp, with others involved either in on-site paper production or shipping to affiliates, or both. Market pulp availability has recently been reduced from Miramichi because of integration to LWC.

Table 7-9
Pulp Mills - Atlantic

Mill/Location	**Capacity** thousand tpy	**Grades**
Scott Maritimes, New Glasgow, NS [2]	220	BSKP
St. Annes, Nackawic, NB	210	BHKP
Irving, Saint John, NB [2]	200	BSKP
Repap, Miramachi, NB [1]	200	BSKP/GW
Stora Forest I., Port Hawkesbury, NS [1]	150	BSP
Fraser, Atholville, NB [1] [2]	130	BSP
Consolidated-Bathurst, Bathurst, NB [2]	170	CTMP
Total	**1,280**	

[1] Integrated on-site paper production
[2] Affiliated mills

The maritime location of these mills results in about 40% of production being exported, mostly to Europe but also to Japan, with one CTMP mill shipping some pulp to an affiliate in the UK. The two BSP mills are the only market pulp mills producing this grade in Canada.

The mills are relatively old, and at best marginal in size. Considerable investment will be needed to upgrade these mills to be internationally competitive.

Commentary on Other Markets

Africa and Middle East

Total volume of North American market pulp to Africa is only 50,000 tpy, due to the relatively small paper and paperboard production and historical supply relationships. Nordic producers sell approximately twice as much on an annual basis. The Republic of South Africa used to purchase up to 150,000 tpy but is now a net exporter. There may be limited opportunity for increased sales in this region, especially in Israel and if Turkey succeeds in joining EEC, but freight costs favour the Nordic suppliers. Canadian market pulp supply to this region will remain small.

Eastern Bloc Countries

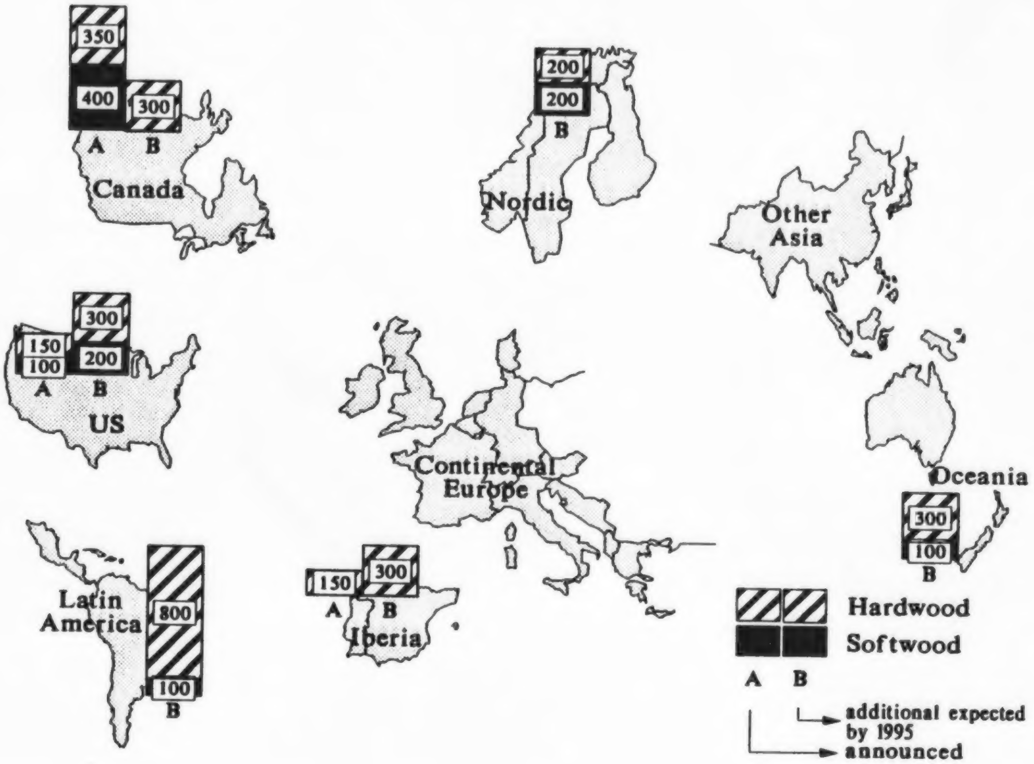
Canadian market pulp trade with the Eastern Bloc countries is negligible, while the Nordic countries, primarily through barter arrangements, ship up to 180,000 tpy. Demand for market pulp could be met internally, provided the pulp industry is allowed to expand in keeping with increased production of paper and paperboard. No major change in this situation is foreseen in the short-term, and it would take a major reversal of policy to favour Canadian pulp by 2010.

In the event that the trend of current economic change continues and Eastern Bloc industrial productivity and efficiency continues to improve, a higher level of pulp exports is likely. The latent wood resources will be exploited, and the USSR could emerge as a formidable competitor in Europe. At this time, it is premature to attempt to quantify the extent of this possible development.

Cost Competitive Position

As pointed out earlier, nontraditional producing regions are playing an ever increasing role in the incremental dried and transferred BKP supply picture (Figure 7-34).

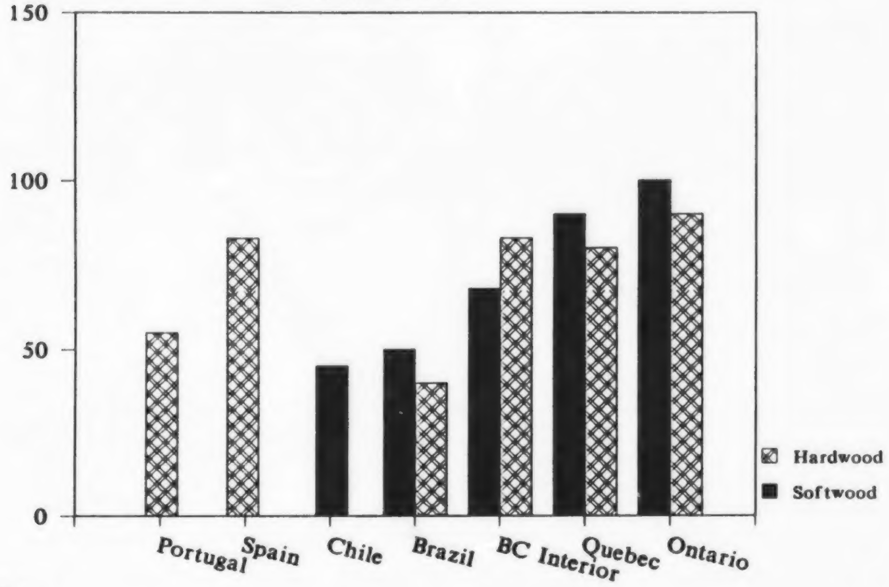
Figure 7-34
BKP Short Term Supply Picture - 1986 to 1995
Incremental Capacity - Dried & Transferred
(thousands of tonnes)


350
400
300
A
B
Canada
200
200
B
Nordic
Other Asia
300
150
100
200
A
B
US
Continental Europe
Oceania
300
100
B
Latin America
800
100
B
150
300
A
B
Iberia
Hardwood
Softwood
A
B
additional expected by 1995
announced

Source: WRA estimates

The vulnerability of Canadian producers to these lower wood cost regions has also been highlighted and is summarized in Figure 7-35.

Figure 7-35
Wood Cost Comparison
(C$/BDMT)



Source: WRA

Canadian producers, quite apart from the substantial wood cost disadvantage, have an array of existing assets ranging from new, modern, and efficient, to older facilities that lack the scale and efficiency of modern installations.

Freight Costs

Ocean

Virtually all market pulp is sold on a delivered basis, either to mill or a port specified by the buyer. In recent years, sellers' responsibility for freight charges has been as high as 18-20% of the selling price. Currently it represents about 10%.

Most of the ocean freight rates which were listed in Volume II have begun to move upward, although the full change of these adjustments will not effect most pulp producers until they renegotiate their existing contracts. The depressed prices, caused by the sharp drop in world trade during the early 1980s and resultant significant overcapacity of bulk cargo space, are disappearing. Low cost ship-building countries are committed to replacing the world's oil tanker fleets, and at present there are no building programs for forest product vessels.

In addition, the depreciated value of the US$ has caused a rapid escalation of vessel operating costs. On the assumption that world trade will continue to grow, there will be an ongoing escalation of shipping costs through 1995, and a more orderly upward movement between 1995-2010.

Threats of another oil crisis which would accelerate bunker oil surcharges, impediment of passage through the Panama Canal, and the mandatory imposition of shipment by national flag have not been considered in this analysis. Any of these would escalate shipping costs for Canadian exporters.

It is not expected that there will be any radical change in methods of ocean transit. Bulk vessels will continue to provide most of the transportation.

Rail

Rail freight costs from Canada to US have remained reasonably stable, but have also started to climb since the beginning of 1988. Rail carriers will seek to redress the fact that freight increases have lagged the general price index, and that the competitive situation caused by rail freight deregulation further forced down the rates. On the other hand, the relative weakness of the C$ versus US$ which benefited Canadian pulp sellers, was somewhat offset by freight costs payable in US$.

The strengthening of the C$ and the move by US railroads to increase rates will result in higher North American freight rates for most shippers. It is too early to assess the impact of Canadian deregulation. Limited competition between two railroads, and exclusive freight dependence for some mills may limit any significant reduction. This may be offset by increased efficiency and productivity, especially where other forms of transportation are available for pulp shipments.

The outlook for rail freight rates in North America over the next 25 years is for the trend to continue to follow the historic pattern of being coupled to the general price index. The differential between rail and road transportation will not change to any significant degree, with the railroads continuing to dominate because of the lack of back haul cargo for the relatively remote Canadian points of pulp origin.

Rail car fleets will likely be improved to include intermodal and piggyback equipment. Pulp suppliers may find it both commercially and economically advantageous to enter the practice of warehousing product at key locations in the US.

Outlook for Pulp Freight Rate Increases to 1995

A review of a detailed schedule of freight rates in 1995 (based on Comtrans Services Ltd. data) shows that there will be general increases of 40-50% throughout the freight system, compared with the rates in effect today.

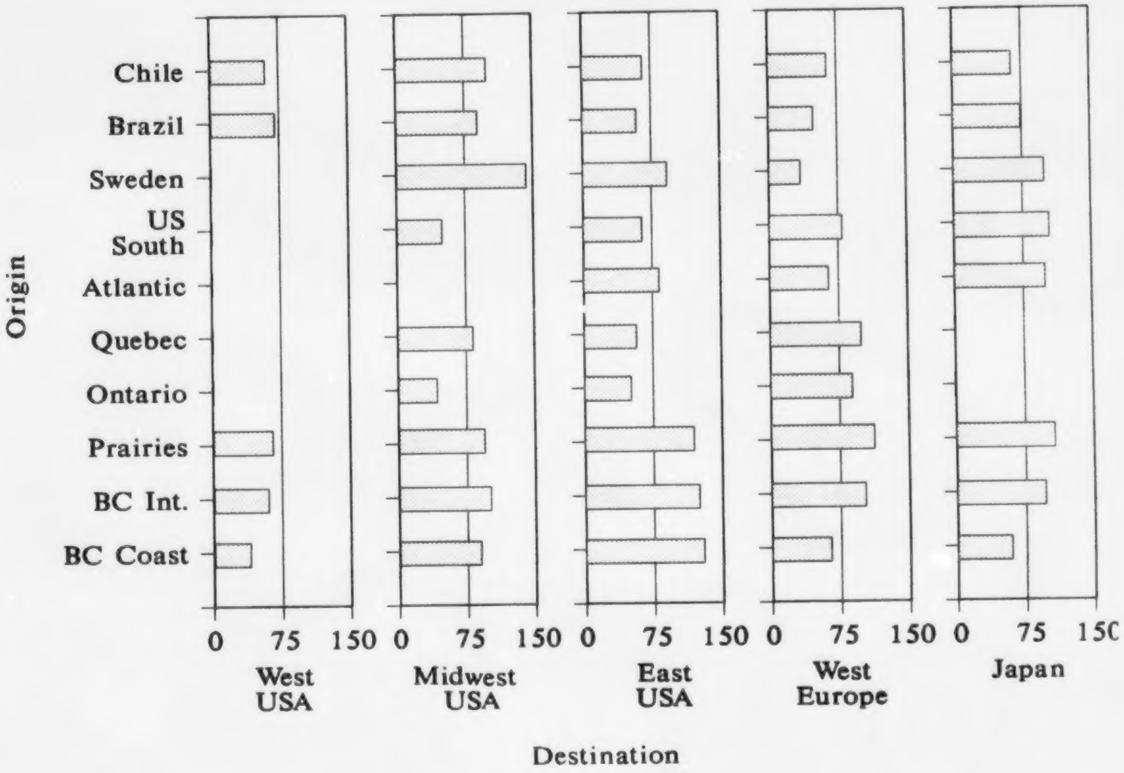
The various differentials will continue at the same levels and will continue to give the following comparative advantages and disadvantages to world pulp suppliers. An example of the major rate structures applicable to North America, Europe and Japan from a range of supply sources is shown in Figure 7-36.

There are no surprises in these comparative freight rates. Regional Canadian supply is competitive to markets that are close (rail) and serviced by water (i.e. BC Coast and Atlantic Canada).

Figure 7-36

Forecast and Comparison of Pulp Freight Rates in 1995

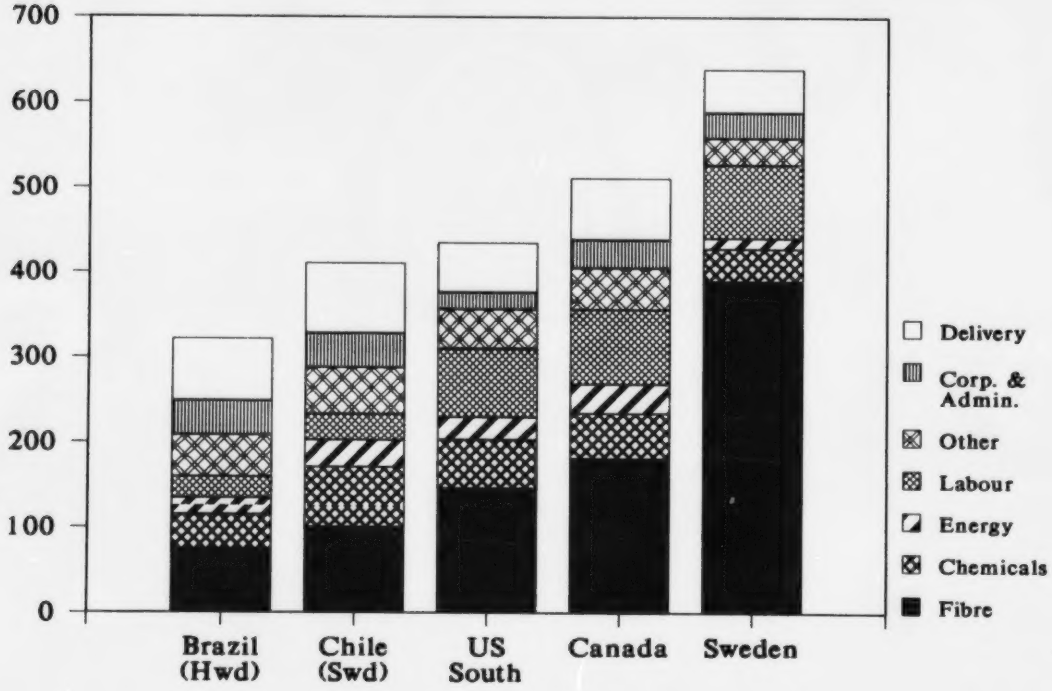
(US$/ADMT)



Source: Comtrans Inc

The cost analysis detailed in Volume VI highlights the cost disadvantage of the typical Canadian market pulp producer, primarily due to the higher wood costs in most regions of Canada compared to producers in the US South or in Brazil. (Figure 7-37).

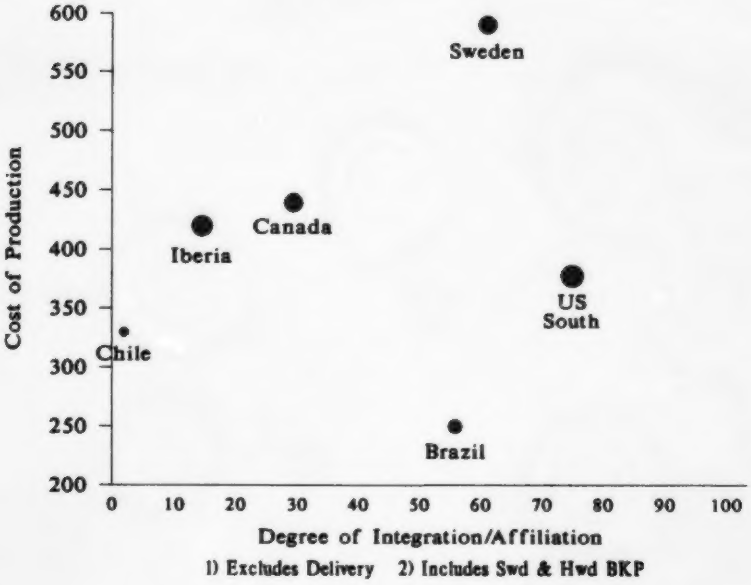
Figure 7-37
BKP - Typical Cost Breakdown
Major Producing Regions
1987
(1987 Delivered Costs, C$/tonne)



Source: PW, RISI

The lower wood costs, due to faster growth rates, enjoyed by emerging producers (e.g. Brazil, Chile, Portugal and New Zealand) suggests they are the main competitive threat to Canada rather than the historical US and Nordic competitors. The Nordic producers have chosen vertical integration for much of their BKP operations as a means to combat their high cost of pulp production (Figure 7-38).

Figure 7-38
BKP - Production Cost vs. Degree of Integration/Affiliation

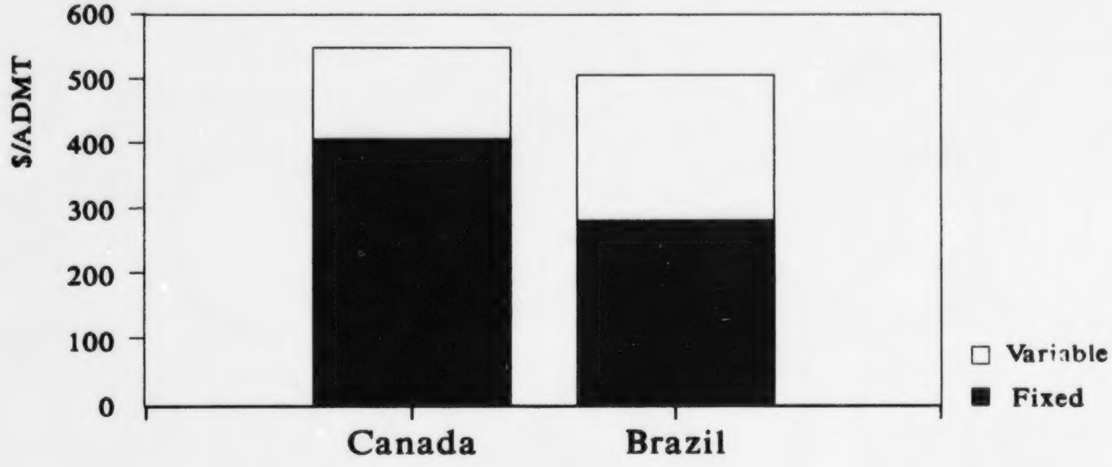


Source: WRA

The US South has clearly been aggressive in this regard while Canadian producers have tended to lag behind the Nordic countries and US, despite their relatively high cost position.

The lowest cost producing regions are better positioned to survive pricing troughs in the market pulp cycle. For instance, due to lower variable costs, a typical producer in Brazil is still able to make profits when a comparable mill in Canada is approaching the variable cost of production (Figure 7-39).

Figure 7-39
BKP Production Cost Comparison
Canada vs Brazil

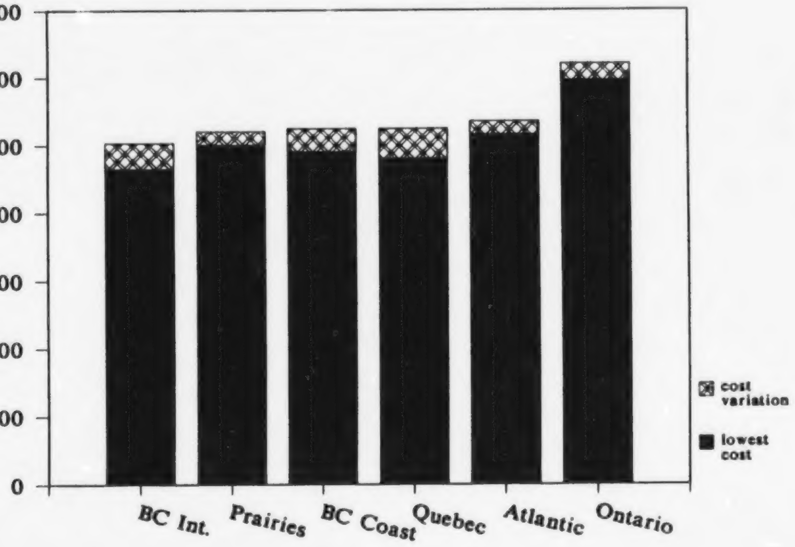


Source: WRA estimates, RISI

The high fixed cost inherent in the capital intensive BKP industry means that producers will continue to operate despite incurring a loss. Consequently, Canadian producers would continue to operate while losing money, maintaining an oversupply situation with falling prices, while low cost regions would be profitable. Clearly, this type of situation is unacceptable.

Canadian production costs vary due to the variation in wood costs and efficiency of operation. (Figure 7-40).

Figure 7-40
BKP - Production Costs Ranges
Regions within Canada
(Avg. Cash Costs Delivered to Destination)
(C$/tonne)

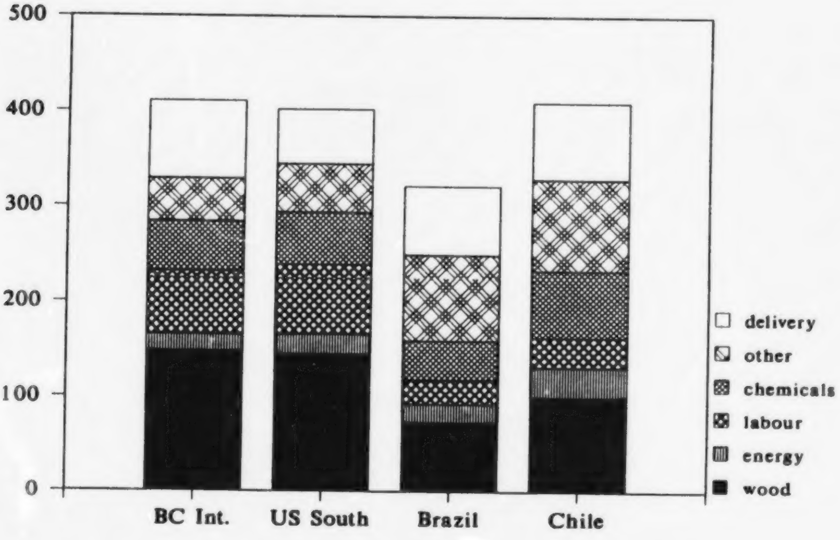


Source: WRA

The BC Interior and Alberta are the lowest cost regions because of more favourable wood costs. Clearly then, the imperative to integrate or affiliate is less acute in these regions than in Ontario and Quebec. Indeed, some of the lower cost BC producers approach the production costs in Brazil.

The foregoing analysis is applied to existing plants with the age and scale of these facilities reflected accordingly. This does not address, as with other products, the relative cost position for a new modern mill in each respective producing region. This, of course, is the situation which faces the private sector as they examine specific sites for new mills. Again, however, it is most probable that the lower cost of wood gives fast-growing plantation wood regions a cost competitive advantage over all of the northern producers. (Figure 7-41).

Figure 7-41
BKP Cost Comparison By Region
Hypothetical New Mills
(C$/tonne)

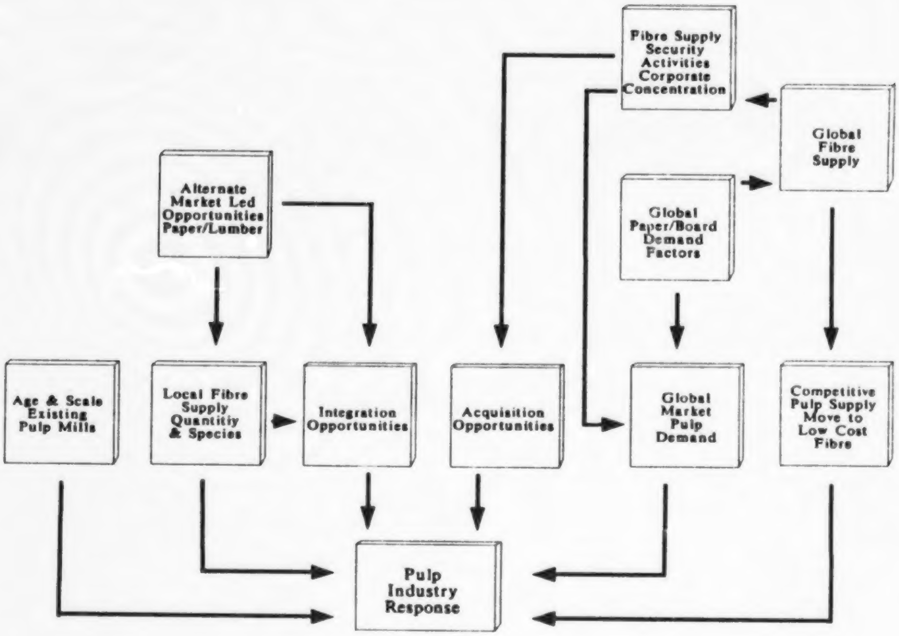


Source: WRA

Regional Implications

The dynamics which will shape the market pulp industry are very complex, as market pulp is interdependent with all other forest products. Therefore, it is impossible to present an illustration which will cover the national industry. Figure 7-42 presents the major segments which affect the pulp sector.

Figure 7-42
Dynamics of the Canadian Forest Products Industry


Fibre Supply Security Activities Corporate Concentration
Global Fibre Supply
Alternate Market Led Opportunities Paper/Lumber
Global Paper/Board Demand Factors
Age & Scale Existing Pulp Mills
Local Fibre Supply Quantitiy & Species
Integration Opportunities
Acquisition Opportunities
Global Market Pulp Demand
Competitive Pulp Supply Move to Low Cost Fibre
Pulp Industry Response

Source: WRA

In addition to the thin market phenomenon which was analyzed earlier in this section of the report, as well as global supply shifts, each individual region in Canada is faced with choices for alternate use of available fibre. Fibre supply in this analysis is viewed primarily as a constraint, but also an opportunity.

The fibre analysis reveals that it will indeed constrain Canada's ability to respond to many market-led opportunities. The situation with regard to fibre constraints, as well as the inventory of existing assets, varies between regions in Canada. Clearly, these differences will govern the plausible range of options open to regional pulp industries and the resulting development scenarios.

This part of the analysis proceeds to define short-term (1995) and long-term (2010) definitive scenarios for each region. These must be viewed as just that--scenarios. They are considered plausible, however, in view of the complex dynamics considered above.

All regions of Canada, with the exception of the Prairies, will be faced with a common strategic issue. That issue is one of product trade-off decisions as the demand for pulp and paper products pushes against the limits of fibre supply.

Increasingly, these trade-offs will move in the direction of paper and away from market pulp. The paradox facing the market pulp industry is one of declining attractiveness despite an increasingly fibre hungry world. The basis and rationale for the apparent contradiction with the current attractiveness of the market pulp business, relates to the increasing integration, affiliation and merging of pulp producers in the traditional producing areas, while new capacity emerges in low cost non-traditional producing regions.

The way in which each region responds to these forces will be shaped by a multitude of factors. The most notable of these include:

- The existing mix of assets and the individual mill-specific situations which will affect the logic of integration or affiliation;

- the local fibre supply situation, quantity and species;

- the initiative taken by Canadian companies in relationship to other investors around the world, who are looking to strengthen their own strategic position;

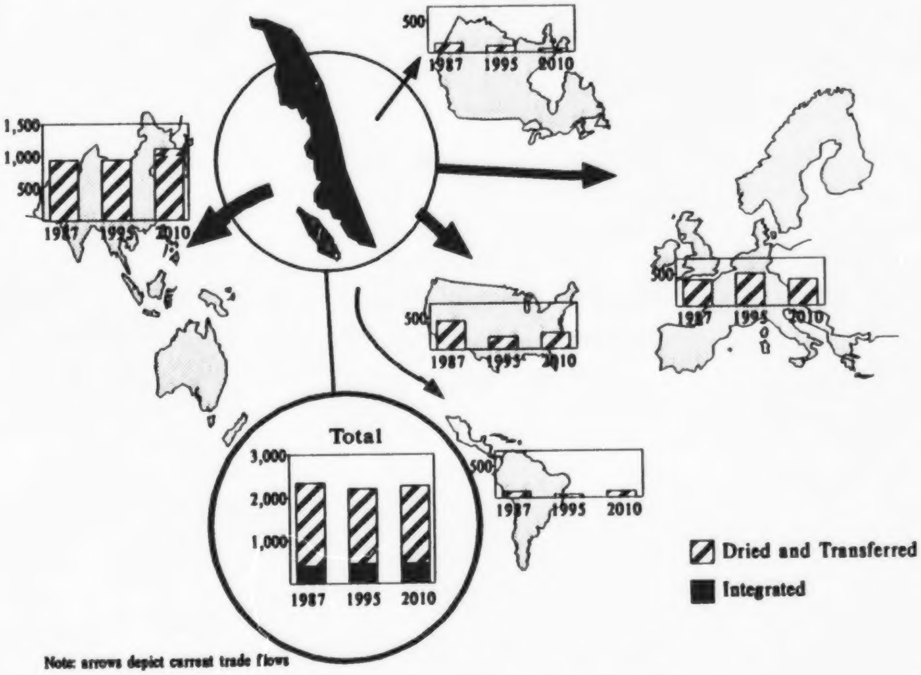
- the geographic focus of demand-led opportunities for all forest based products.

BC Coast

Pulp producers on the BC Coast will be faced with some of the most difficult decisions in Canada. Total BKP production on the Coast is expected to decline (Figure 7-43) as marginal pulp producers opt to convert operations to alternate products to achieve better returns per m^3 of wood input. New incremental BKP capacity is unlikely by virtue of fibre supply and cost.

Existing mills that do modernize and remain viable will tend to affiliate (as in other parts of Canada). The ability to convert to printing and writing paper grades will be limited by the lack of economically accessible hardwood.

Figure 7-43
Pulp Scenario to 2010 - BC Coast
(thousands of tonnes)



Note: arrows depict current trade flows

Source: Statistics Canada, WRA estimates

This region is characterized by high wood costs (difficult terrain), specialized species (e.g. cedar and Douglas fir) and older mills facing investments needed to increase productivity and meet environmental requirements. Some mills are already upgrading their operations and specializing (e.g. species segregation) in response to opportunities in the marketplace. Most are well positioned to capitalize on demand in the Asia-Pacific markets due to deep sea shipping berths that provide notable offshore shipping cost advantages, though not necessarily sufficient to offset the higher cost of wood on the Coast.

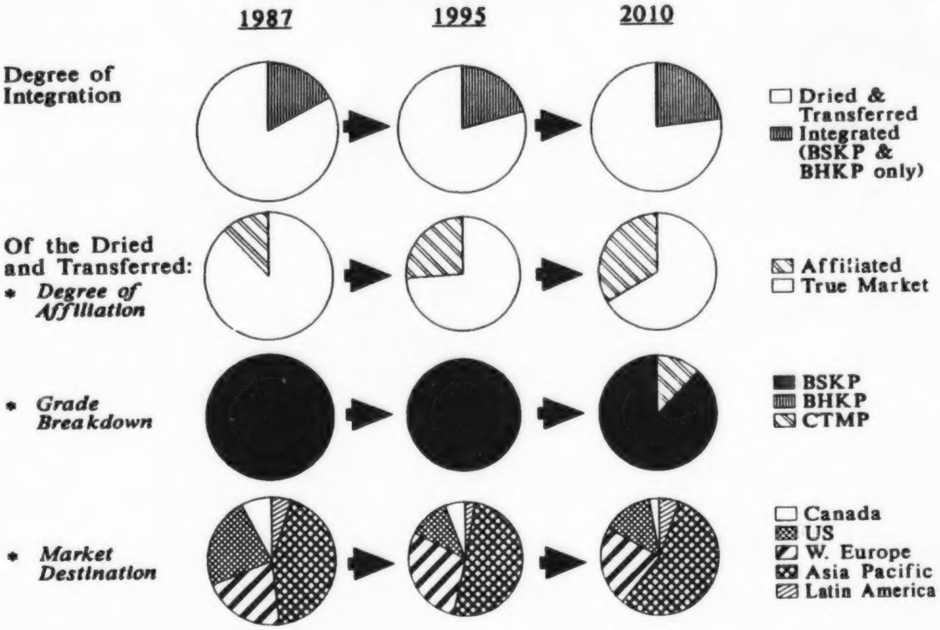
This region also has little or no additional fibre available for expansion. The competition for fibre will be especially acute because of this.

The strategy for pulp producers on the Coast is likely to be a combination of virtually all the alternatives available to them:

- Integration of existing BKP mills into paper products;
- more affiliation of the current BKP "dried and transferred" shipments;
- conversion of BKP capacity to more specialized grades;
- closure of marginal BKP capacity;
- expansion in CTMP capacity (but without hardwood availability).

This will result in a reduction in true market BKP shipments (Figure 7-44).

Figure 7-44
BC Coast
Pulp Industry - Structural Shifts to 2010
BSKP/BHKP/CTMP



Source: WRA estimates

This structural shift will have market region biases. Shipments of BKP to Asia-Pacific (notably Japan) will likely increase, but will become much more affiliated as Japanese paper companies strive for security of supply. Also, additional CTMP shipments to this market area are probable because of the aggressive role which will be taken by Japanese paper producers in technological developments, such as the increased use of CTMP in printing and writing papers in order to reduce costs.

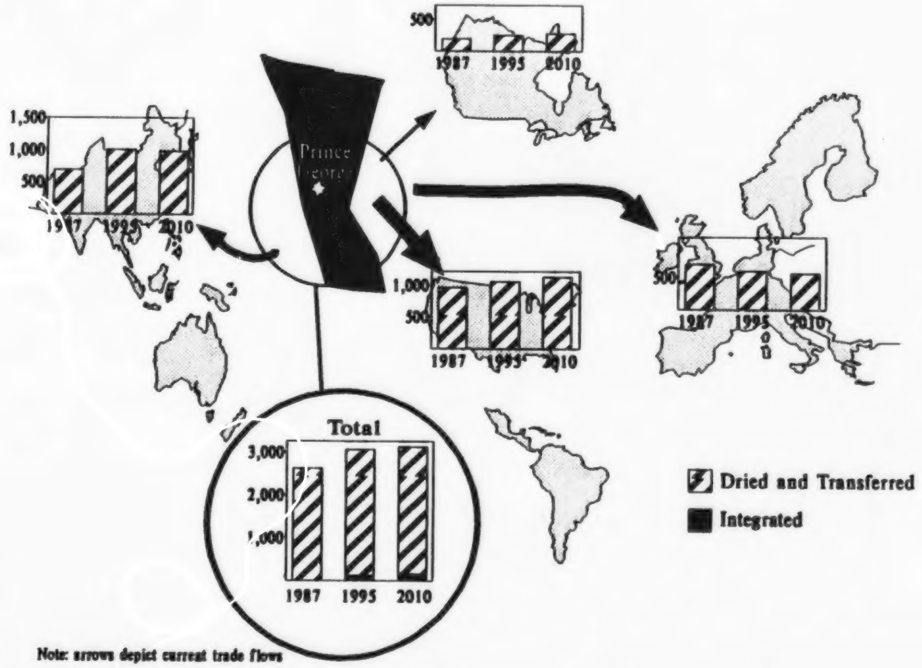
Shipments to the rest of Canada and the US will drop because the reduced market pulp capacity will be concentrated in Asia-Pacific and Western Europe (freight cost regions).

BC Interior

The BC Interior is one of the most attractive areas in Canada for BKP production because of reasonably competitive wood costs. However, additional inland transportation make freight costs to the Pacific Rim higher than from the BC Coast. Freight costs from this region to market BKP consuming markets in Eastern Canada and US are high, but are reasonable to the Midwest.

Pulp production in the region is mostly nonintegrated (P.G. and Finlay are the exceptions) and is heavily weighted towards BSKP. Pulp markets for this region are geographically diverse, with major quantities destined for the US, Asia-Pacific and Western Europe (Figure 7-45).

Figure 7-45
Pulp Scenario to 2010 - BC Interior
(thousands of tonnes)

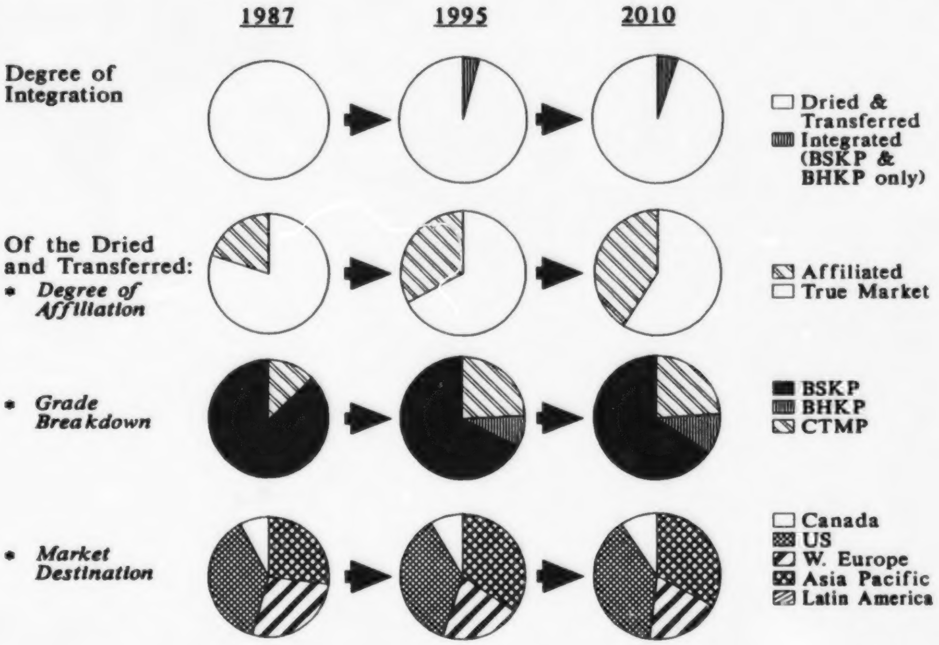

500
1987 1995 2010
1,500
1,000
500
1987 1995 2010
Prince George
1,000
500
1987 1995 2010
500
1987 1995 2010
Total
3,000
2,000
1,000
1987 1995 2010
Dried and Transferred
Integrated

Note: arrows depict current trade flows

Source: Statistics Canada, WRA estimates

There is a meaningful but still relatively modest quantity of CTMP capacity (Figure 7-46).

Figure 7-46
BC Interior
Pulp Industry - Structural Shifts to 2010
BSKP/BHKP/CTMP



Source: WRA estimates

Demand growth for printing and writing papers in the US West will provide an opportunity for integration for some existing BKP producers. Lumber will provide intense competition for softwood fibre, however, and this is expected to hold total BKP production flat.

The availability of hardwood in the northern part of the region will allow a response to demand-led growth in BHKP and CTMP. Both will provide opportunities for increased dried and transferred shipments from this region, as well as possibilities for integration into paper.

Dried and transferred shipments of BSKP should decline slightly, but with a meaningful shift towards affiliated shipments. This trend will be most marked into the Asia-Pacific and US markets where the need and desire to affiliate is expected to be most pronounced. Shipments to Europe are expected to decline, however, as the flow of product will be redirected in response to an increasing number of investment partners from the Asia-Pacific region.

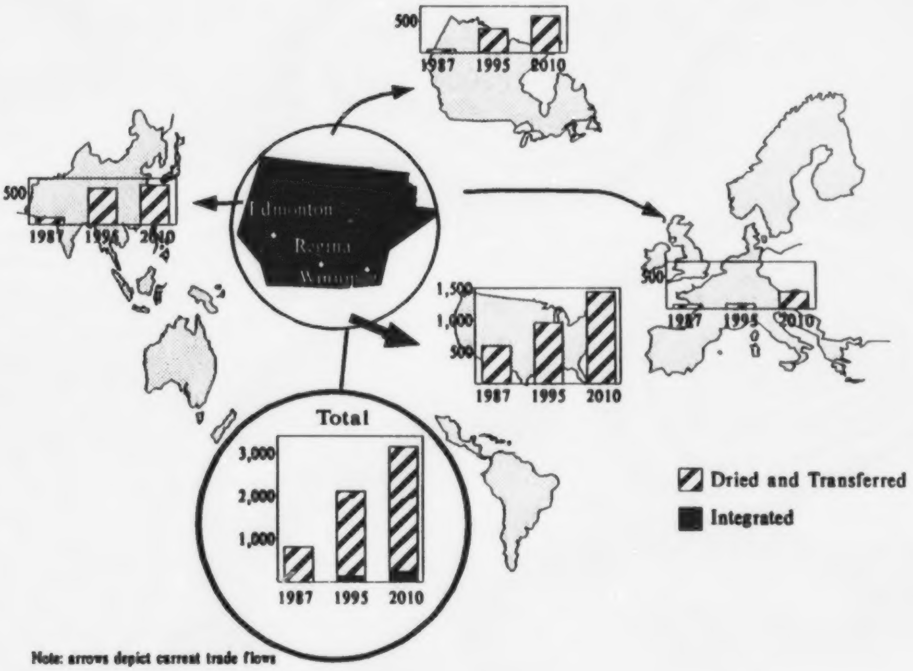
Shipments of dried and transferred pulp to the US market is also expected to be reduced in the short-term in response to modest integration activity and growing demand in the Pacific Rim and Asian markets. In the long-term, however, US shipments should continue upward as new BHKP and CTMP capacity comes on stream.

Prairies

Current production on the Prairies, which is mostly BSKP, is modest by Canadian standards at well under a million tpy. This is changing rapidly, with new capacity underway not only in BSKP but also and more notably in BHKP and CTMP. The availability of both softwood and hardwood permits the development of all of these grades. Capacity increases will continue to be biased towards the latter two in response to increased demand.

The Prairies have a geographical disadvantage when exporting to European and Asia-Pacific markets. However, the Prairies will increase pulp and paper production, and will likely have to export some of their additional pulp production, in addition to more shipments to the US. (Figure 7-47).

Figure 7-47
Pulp Scenario to 2010 - Prairies
(thousands of tonnes)



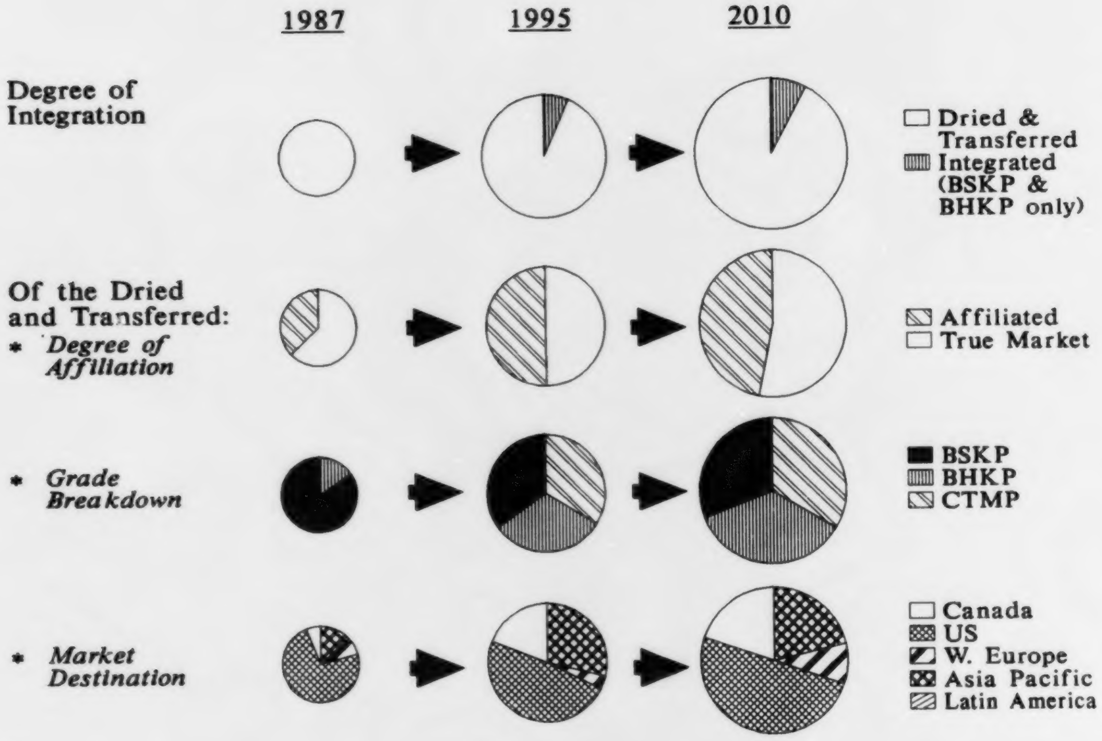
Note: arrows depict current trade flows

Source: Statistics Canada, WRA estimates

True market pulp shipments are presently a much smaller part of total dried and transferred pulp than in other regions, with almost 40% moving as affiliated. The split between true market and affiliated is not expected to change much, though it will tend to move towards the latter category because of the existing mill ownership structure.

Total dried and transferred shipments are expected to more than triple in the long-term (2010) scenario, increasing to almost three million tonnes (Figure 7-48). The US will remain the primary market for the region, but the Asia-Pacific market will become increasingly important, and consume some 20% of the total dried and transferred shipments by 2010.

Figure 7-48
Prairies
Pulp Industry - Structural Shifts to 2010
BSKP/BHKP/CTMP



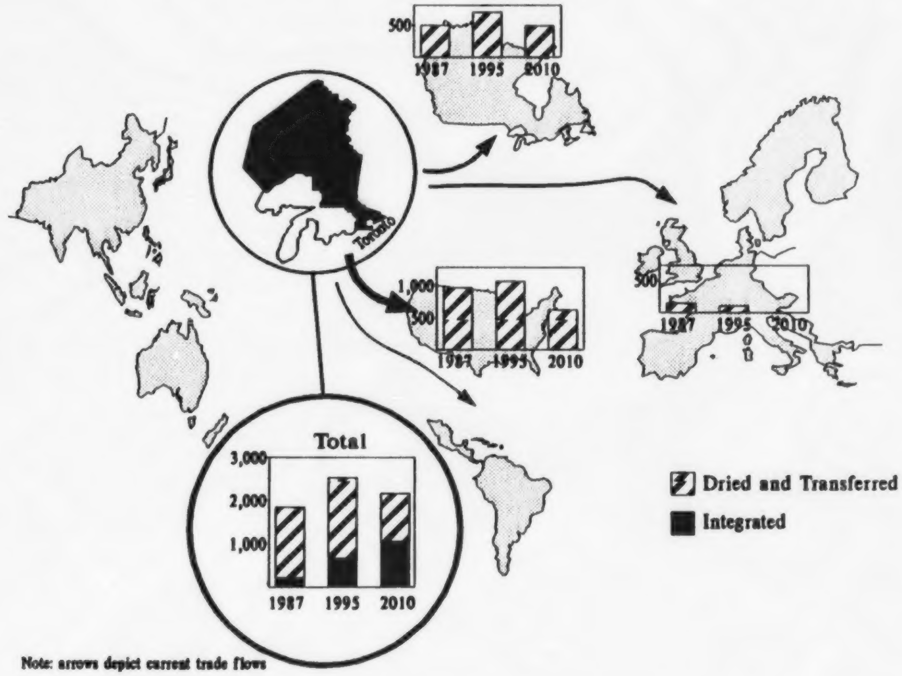
Source: WRA estimates

Ontario

The current BKP production of about 1.8 million tonnes is largely dried and transferred, the majority of which is actually true market pulp. Most of it is destined for the US market (Figure 7-49). Significantly more affiliation is possible with a number of the remaining nonintegrated paper mills in the US Midwest. The short-term scenario calls for only a modest shift in this general strategic direction as producers delay plans for a major shift in direction under the current buoyant BKP market conditions.

Ontario producers have one of the better opportunities in Canada to integrate their production into higher value grades such as printing and writing papers. The existing mills are of a scale that allows meaningful integration, and the region is well positioned geographically to serve the large paper consuming markets in the US.

Figure 7-49
Pulp Scenario to 2010 - Ontario
(thousands of tonnes)



Note: arrows depict current trade flows

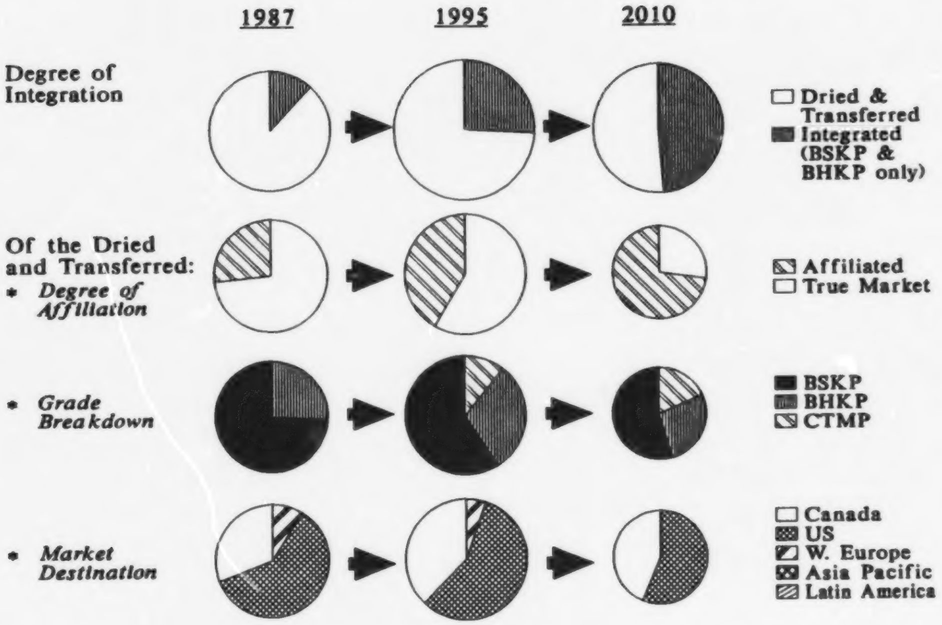
Source: Statistics Canada, WRA estimates

Competition will be keen for the relatively scarce softwood in the province, especially from the newsprint sector. The underutilized hardwoods will lead a shift in BKP production from BSKP to BHKP, both for dried and transferred pulp as well as integrated operations. The hardwoods can also logically be used in mechanical fibre-based printing papers and this trend is likely to provide competition for the hardwood fibre as well.

Market mechanical pulps will also play a role in the fibre supply picture in Ontario. The outcome of this is that it seems unlikely that new BKP mills will have a significant role in Ontario's future. The scenario for total BKP production includes productivity-related capacity only to 1995, and for a reduction in capacity by the year 2010, as some of the aging mills convert to alternate products or are shut down.

The current emphasis on the US market will be maintained, albeit reduced in the long-term, as capacity declines. It can be expected, for example, that shipments to Europe will all but disappear by 2010, and true market pulp will play only a very minor role by this time (Figure 7-50).

Figure 7-50
Ontario
Pulp Industry - Structural Shifts to 2010
BSKP/BHKP/CTMP



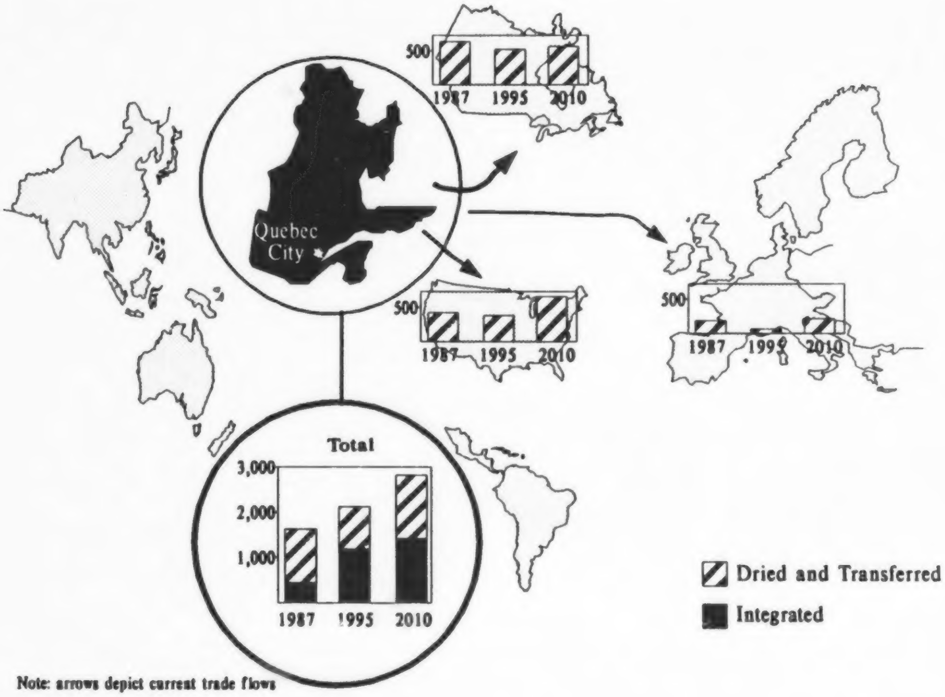
Source: WRA estimates

Quebec

Quebec's pulp shipments are not export oriented with the majority being sold within Canada and the US. (Figure 7-51)

Quebec is one of the few regions in Canada with reasonably modern mills and a high component of BHKP and CTMP in its pulp mix. The industry has already moved in the direction of higher value added production, a trend that is likely to be continued in future years. About two-thirds of its BKP is dried and transferred (Figure 7-52). Quebec is more integrated than other regions in Canada but there is still considerable opportunity for value-added products.

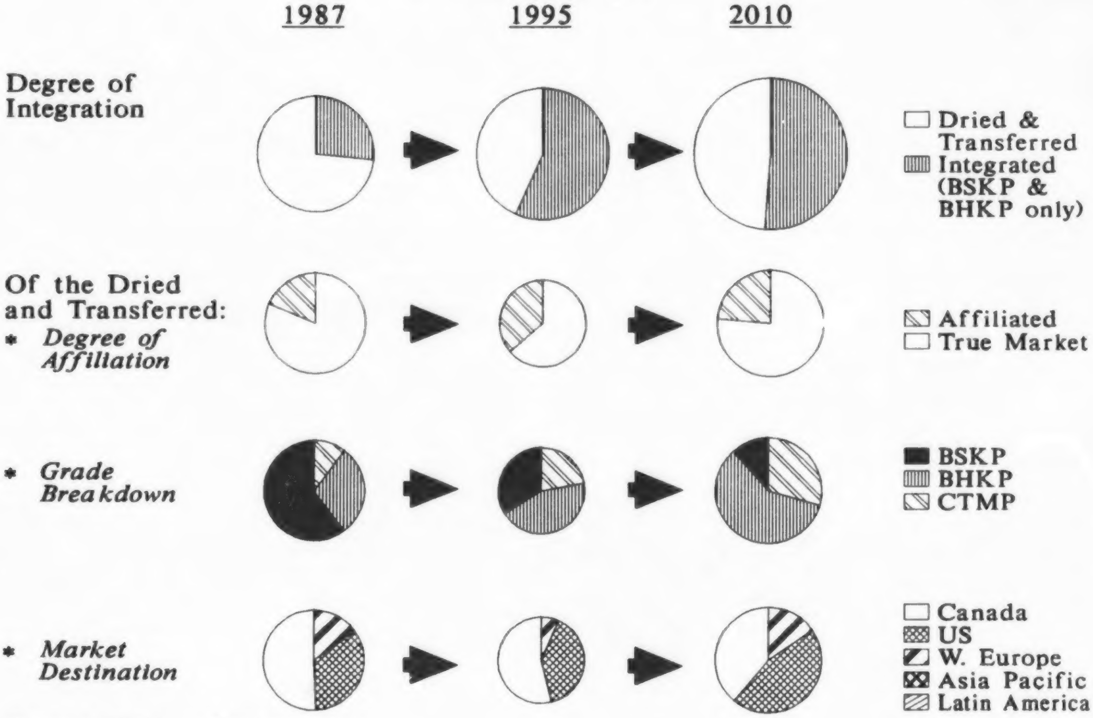
Figure 7-51
Pulp Scenario to 2010 - Quebec
(thousands of tonnes)



Note: arrows depict current trade flows

Source: Statistics Canada, WRA estimates

Figure 7-52
Quebec
Pulp Industry - Structural Shifts to 2010
BSKP/BHKP/CTMP



Source: WRA estimates

Given the historical domestic orientation and availability of hardwood to facilitate integration into printing and writing papers, it is expected that some Quebec producers will move quickly towards integration. There will also be affiliation with domestic paper and paperboard producers, many of whom will be older Quebec-based newsprint machines converted to high valued printing and writing grades.

Quebec will also be one of the few regions in Canada which will have a net increase in dried and transferred shipments. With no additional softwood supply, the provincial hardwood resource provides an opportunity to respond to a market-led opportunity.

Quebec will likely achieve all the goals of integration, affiliation and specialization with their market pulp, making it unique in this regard within Canada.

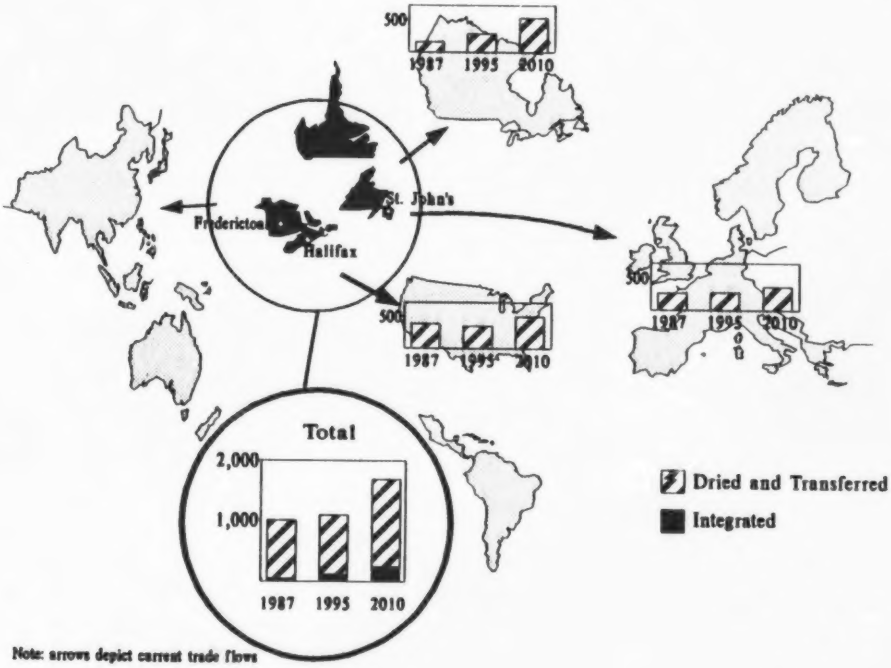
Atlantic

The majority of Atlantic Canada's market BKP is shipped to the US market, with smaller quantities to Western Europe and Canada (Figure 7-53).

The Atlantic provinces will likely move counter current to the trend towards paper in favour of pulp. Europe, one of the more favourable market destinations, will be seeking a secure supply of pulp. Also, Northeastern US is one of the more market pulp dependent regions in the US. These secure markets should make market pulp a more attractive product for Atlantic Canada than in other regions of Canada.

But the problems of fibre supply constraints in the Region and will have to be addressed soon (such as budworm damage, access to and development of private woodlands, and the need for further enhancement of reforestation programs in some areas), if expansion of the present forest industry base is to be achieved.

Figure 7-53
Pulp Scenario to 2010 - Atlantic
(thousands of tonnes)


500
1987
1995
2010
St. John's
Fredericton
Halifax
500
1987
1995
2010
500
1987
1995
2010
Total
2,000
1,000
1987
1995
2010
Dried and Transferred
Integrated

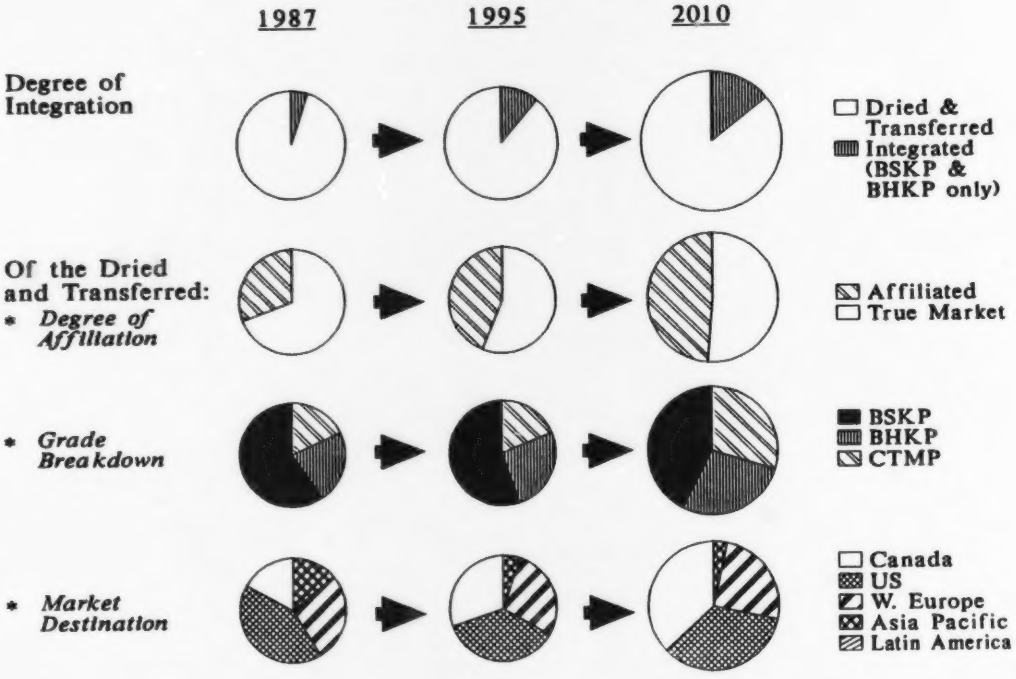
Note: arrows depict current trade flows

Source: Statistics Canada, WRA estimates

This region has relatively little integration of its pulp mills and, at this time, a majority of the dried and transferred shipments are affiliated (Figure 7-54).

The BKP scenario for this region is one of modest increase in capacity and little change in the structure of the industry. The current modest shipments to Europe will be increased significantly on a percentage basis but will still be modest in absolute terms.

Figure 7-54
Atlantic
Pulp Industry - Structural Shifts
BSKP/BHKP/CTMP



Source: Statistics Canada, WRA estimates

As in other regions in Eastern Canada there is surplus hardwood availability. This will not only drive an increase in BHKP capacity but also spawn an increase in CTMP, both in response to market-driven opportunities in the US and Europe.

APPENDIX I

DEFINITIONS OF OTHER PAPER AND PAPERBOARD

Other paper and paperboard include a broad spectrum of grades, with several end uses. They can be broadly categorized as follows:

1. Tissue
2. Kraft Papers
3. Containerboard
    a. linerboard
    b. corrugating medium
4. Other Boards
    a. boxboard
        i. folding boxboard
        ii. liquid packaging board
        iii. food service
        iv. graphic
    b. others
        i. tubestock and drum
        ii. construction and industrial grade

For our purposes in this report, we have grouped kraft papers with containerboard grades in the same chapter.

GLOSSARY OF TERMS

ADMT	Air dry metric ton
ADB	Asian Development Bank
Aseptic packaging	Sterilized packaging
Basis weight	The weight of a specified area of paper or paperboard. Usually in g/m^2 or lb/ream where a ream is a specified number of sheets of a given size.
BCC	BC Coast
BCI	BC Interior
BCTMP	Bleached chemi-thermomechanical pulp
BDMT	Bone dry metric ton
BHKP	Bleached hardwood kraft pulp
BKP	Bleached kraft pulp
Bogus corrugating medium	Corrugating medium made from recycled paper stock.
Boxboard	Relatively thick solid paperboard used in folding box manufacture.
BSKP	Bleached softwood kraft pulp
Captive pulp	Not available for the open market.
CIS	Communication and Information Services
cm	centimetre
CMP	Chemi-mechanical pulp
Containerboard	Any type of single and multi-ply solid and corrugated boards used to make up boxes and other containers for shipping materials, and the type of paperboard used to make them up.

Commodity grade	A product with standardized specifications sold into a market with several buyers and sellers, none of which can individually influence its price.
Corrugated medium	Corrugated material that is sandwiched between exterior layers of linerboard.
CPPA	Canadian Pulp and Paper Association
CTMP	Chemi-thermomechanical pulp
DBH	Diameter breast height
ECE	Economic Commission for Europe (US)
Economy of scale	Economically sized mill, achieving the lowest average cost per unit of production in relation to discrete major items of capital equipment.
EEC	European Economic Community
EFTA	European Free Trade Association
e.g.	for example
EPI	European Paper Institute
ETTS IV	European Timber Trends, Fourth Report, ECE
Extensible paper	A high-bursting-strength kraft paper, achieved by treating the paper sheet in such a way that it will stretch when put under tension, making it suitable for use in shopping bags and wrappers.
FAO	Food and Agricultural Organization of the United Nations
FOB	Free on board
Formsbond	Term applied to paper used in the manufacture of multi-ply business forms (other than carbonless); also used to represent continuous form-fed applications such as computer printout paper.
Freeness (CSF)	A measure of the rate that water will drain through a pad of pulp. Commonly used to estimate drainage behaviour of paper.

Freesheet	Paper containing less than 10% mechanical pulp, usually 0%; commonly referred to as woodfree in Western Europe.
Furnish	The various components, comprising pulps, additives, fillers and extenders, used in papermaking.
g	gram
g/m^2	grams per square metre
GATT	General Agreement on Trade and Tariffs.
GDP	Gross domestic product
Glassine	Light, dense, translucent paper made from highly refined chemical pulp and possessing a high degree of hydration. Used as envelope windows and in protective packaging of various types of foodstuffs.
GNP	Gross national product
Greenfield	A new mill including all facilities and costs.
Groundwood	Mechanical pulp usually produced on stone grinders. Often used as a general term for all mechanically produced pulps.
ha	hectares
HAS	H.A. Simons Ltd.
High yield pulp	Pulp with a yield over 85% based on dry weight of wood.
Hwd	Hardwood
HYBS	High yield bleached sulphite
i.e.	that is
Integrated paper mill	A mill with pulping facilities connected to a paper machine.
Isobaric	A term used when referring to any process under constant pressure.

kg	kilogram
km	kilometre
Kraft (pulp)	Means "strength" in German; the term commonly used as a name for sulphate chemical pulp.
Linerboard	Exterior layers of paperboard used to make containerboard.
Liquid packaging (LPB)	Boxboard used in the packaging of liquid.
LWC	Lightweight coated paper (less than 60 g/m^2).
m	metre
m/min	metres per minute
m^3	cubic metre
mm	millimetre
MF	Machine finished. Paper is calendered on-machine to achieve surface properties as opposed to supercalendered (SC) which is an off-machine process.
Mullen burst test	The bursting strength of paper. It is usually determined on a tester that bears the name and is expressed in kilopascals per square metre.
Multi-ply grades	A paper or paperboard sheet that is made up of two or more layers.
MWC	Medium weight (60-90 g/m^2) coated paper containing mechanical pulp.
Nonintegrated	Pulp produced on a location separate from the paper mill.
Norpac	Joint venture company of Jujo and Weyerhaeuser.
Norscan	Canada, USA, Sweden, Finland, Norway
OCC	Old corrugated containers.
Oligopoly	A market situation in which control over the supply of a commodity is held by a small number of producers each of whom is able to influence prices and thus directly affect the position of competitors.

PGW	Pressurized groundwood pulping process
%	per cent
Phloroglucenal test	An indicator of lignin in paper. Used to identify presence of mechanical pulp.
Pigmentized	Containing mineral additives to enhance paper characteristics.
PM	Paper machine
P&W	Printing & writing grades
PPI	Pulp and Paper International
Printability	The ease with which paper can be printed to high quality standards.
Rationalization	To optimize the use of equipment, personnel or processes from a mill in order to make it more efficient.
RISI	Resource Information Systems, Inc.
RMP	Refiner mechanical pulp
Roundwood	Wood delivered to a pulp mill in log form, with or without bark attached and cut to specified lengths or in whole log lengths.
s	second
SBK	Semi-bleached kraft, approximately 65-75 brightness
SBS	Solid bleached sulphate (boxboard)
SC	Supercalendered
Semi-chemical medium	Corrugating medium produced from fibres produced by a high yield chemical pulping process.
SGW	Stone groundwood
SPCF	Swedish Pulp and Paper Association
SUS	Solid unbleached sulphate (boxboard)
Swd	Softwood

t	metric ton
Testliner	Linerboard produced from secondary fibre.
TMP	Thermomechanical pulp
tpd	tonnes per day
tpy	tonnes per year
Twin-wire machine	Any type of paper, paperboard, or pulp sheet forming machine that uses two wires to form the sheet.
UKP	Unbleached kraft pulp
Value-added	Incremental increase in net value due to a process step.
Vertical integration	Incorporation of several production or process stages within one corporation.
vs	versus
WCP	White chemical pulp
WLC	White lined coated board
Woodfree (paper)	Paper containing less than 10% mechanical pulp, usually 0%.
WRA	Woodbridge, Reed and Associates
y	year